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The World's Work

WALTER H. PAGE, EDITOR

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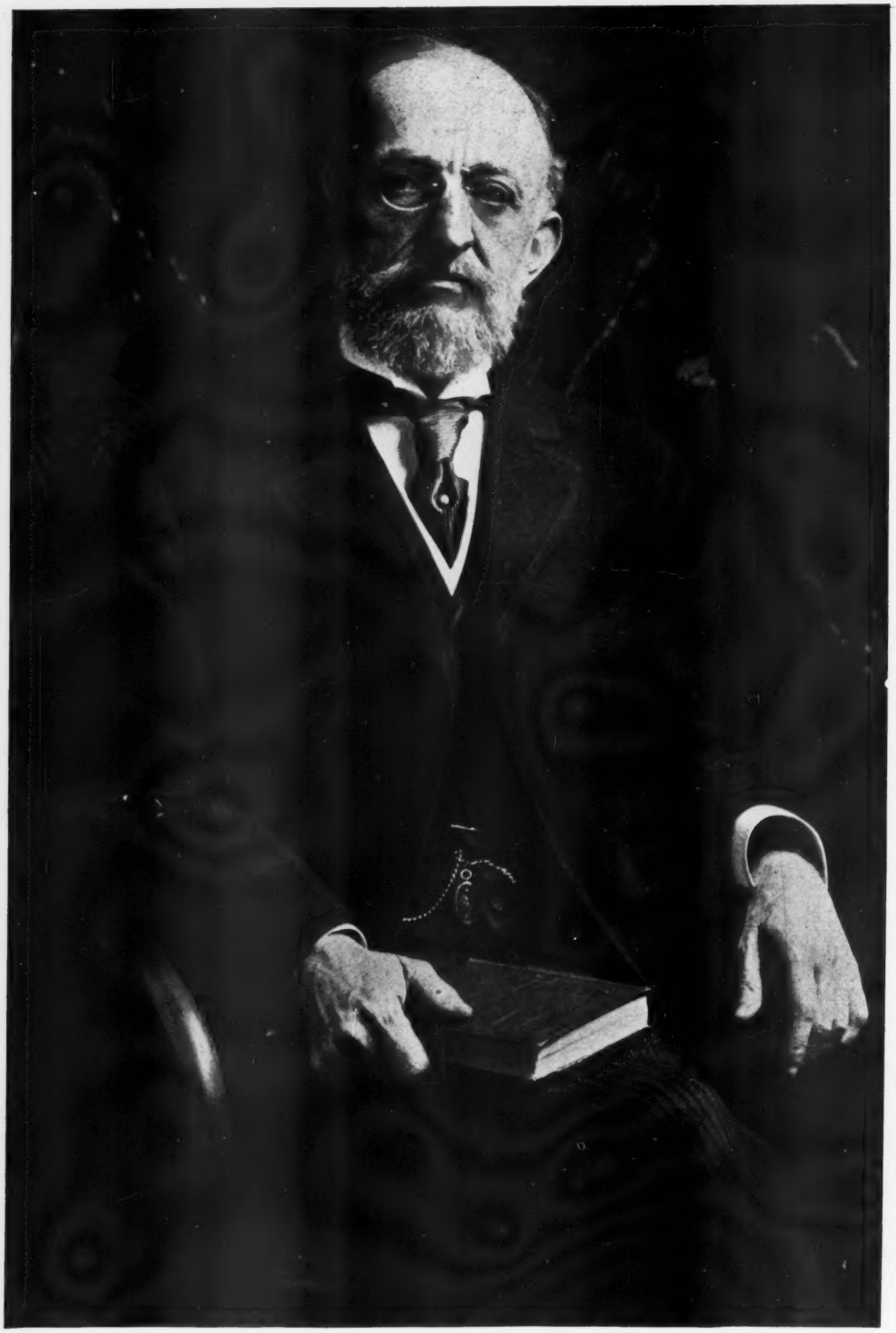

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HON. OSCAR S. STRAUS, OF NEW YORK, THE NEW SECRETARY OF COMMERCE AND LABOR

"HE KNOWS BOTH HIS COMMERCE AND HIS LABOR—BY CLOSE STUDY, BY PERSONAL EXPERIENCE AND BY A SYMPATHETIC INTEREST IN THE PRACTICAL AFFAIRS OF EACH"

[See page 8261]

THE WORLD'S WORK

DECEMBER, 1906

VOLUME XIII NUMBER 2

The March of Events

WE DO not live on any Utopian planet, nor has our own world yet swung into the millennium. There is much to be done, therefore, before even our prosperous and pleasant part of the earth becomes a perfect home, and before we ourselves become an ideal society.

Still, as Christmas comes, we have as many reasons to be content, to take good cheer, to feel kindly toward all men and all nations, as any people under the sun—perhaps more such reasons than any other people; and it is a good exercise to think of these reasons now instead of the misfortunes and struggles that engage us overmuch during the rest of the year.

We have had bountiful crops; we have such a volume of traffic as was never dreamed of before, an era of good dividends, of plenty of work, of high wages, and (in spite of our masters, the trusts and corporations,) abundant opportunity yet for initiative and ambition.

Let us pray to be delivered from all class hatred and uncharitableness and to be at peace with ourselves and our neighbors, bearing good will to all.

THE TASKS BEFORE CONGRESS

CONGRESS meets to confront a number of unfinished tasks left over from the last session. The Moroccan treaty will come up early for a vote. If it be passed, the last luxurious refuge of absconders—which of late has been insecure even without a treaty—will be closed. The treaty with Santo Domingo, one of the projects dear to President Roosevelt, will doubtless come out of the limbo where the Senate deposited it while its wrath was yet hot over the informal way in which the Administration had negotiated the preliminaries. The wrath has had time to cool, and the delay has perhaps sufficiently vindicated the Senate's dignity to permit the treaty to be made, if President and Senate can agree on terms. The Philippine tariff is due to come up again to meet once more the determined opposition of the "Interests."

For our domestic comfort, Congress will consider the setting off of great forest reserves in the Appalachian and the White Mountains, and the reduction of tariff duties on works of art. These are two proposals that deserve to be carried out. An effort will be made to have authorized a system of swamp reclamation similar to the admirable irrigation service. The moot question of restricting immigration is also in a fair way to be settled by the imposition of more rigid qualifications for entrance. The session is more likely to go down in history, however, as the one in which an American "corrupt practices act" was passed than for any other reason that can be foreseen. The laws prohibiting political contributions from corporations and requiring publicity about campaign funds are in a way to be passed.

The recent Cuban revolution may have some effect on the chances of the bill to give citizenship to the Porto Ricans. Prospects are less bright for its passage then they were a year ago. It still remains for Congress to decide whether we shall build a battleship even larger than the new British leviathan, the *Dreadnought*. But the most ticklish problem

THE LATE CHARLES DUNCAN McIVER

PRESIDENT OF THE NORTH CAROLINA STATE NORMAL COLLEGE FOR WOMEN

"HE WAS SO DEFINITELY HELPFUL A MAN AND HE HAD SUCH A SOUND VIEW OF LIFE THAT THE MEMORY OF HIM IS BETTER THAN ALL SERMONS ON CONDUCT"

[See page 8265]

Photograph by Brown Bros.

COMMANDER ROBERT EDWIN PEARY, U. S. N.

HE HOLDS THE "FARTHEST NORTH" RECORD, HAVING SLEDDED UNTIL WITHIN 200 MILES OF THE POLE, WHEN HIS PROGRESS WAS STOPPED BY OPEN SEA

of all is Chinese exclusion. We have heard much of late on this from those who have been demanding that the wall be kept up. On the other hand, Japan's protest at the discrimination against the Japanese in the San Francisco schools is a straw showing what China's attitude is likely to be on our more drastic national discrimination against the Chinese.

If with this goodly roll of tasks, which covers only a few out of many, the dominant party will emerge long enough from its content with present conditions to revise the tariff, the President can more justly say at the close of this session than he said at the close of the last, that Congress has settled the most important problems that confronted the people. But it is doubtful whether all these problems will be settled, for much of the time of the session will be taken up with the appropriation bills, and much may be left to the new Congress just elected.

MEANING OF THE NOVEMBER ELECTIONS

THE defeat of Mr. Hearst as a candidate for Governor of New York saved the state from the humiliation of approving his programme of class hatred and of having such a man as its executive. But the relatively narrow margin by which he was defeated reveals a state of public opinion that is almost as serious from a moral point of view as his election would have been.

The strength of the Hearst movement is the widespread feeling of resentment against the power of capital—the great corporations and trusts—and against their abuse of this power, in politics and in industry. For such a feeling there is good reason. But in this case, as usual, the feeling gathered force till it went beyond all sane judgment of remedies and became a fierce and unreasoning vindictiveness. It became fiercer and stronger than any similar movement in our recent politics—perhaps than any movement in any period of our politics—because of the unscrupulous methods by which it has been organized and fomented.

The lesson is plain. Wherever there are abuses of corporate power they must cease—must be stopped. That is Mr. Roosevelt's square deal. That is the platform on which Mr. Hughes, as Governor of New York, will stand. The only thing that can save the state from the danger of unscrupulous radicalism is the enforcement of the laws against abuses that justly cause social unrest.

This is the meaning of the election in New York. In other places where there was a Hearst movement—in Massachusetts, in Chicago, in California—it suffered a more decisive moral defeat. Taken altogether, the elections showed a Republican victory, safer and larger than the dominant party has usually won on years that fall midway between Presidential elections. It is a regrettable fact that the Democratic party in so many states has suffered the moral disadvantage of having its machinery captured by extreme and unscrupulous radicalism.

THE PANAMA CANAL BY CONTRACT

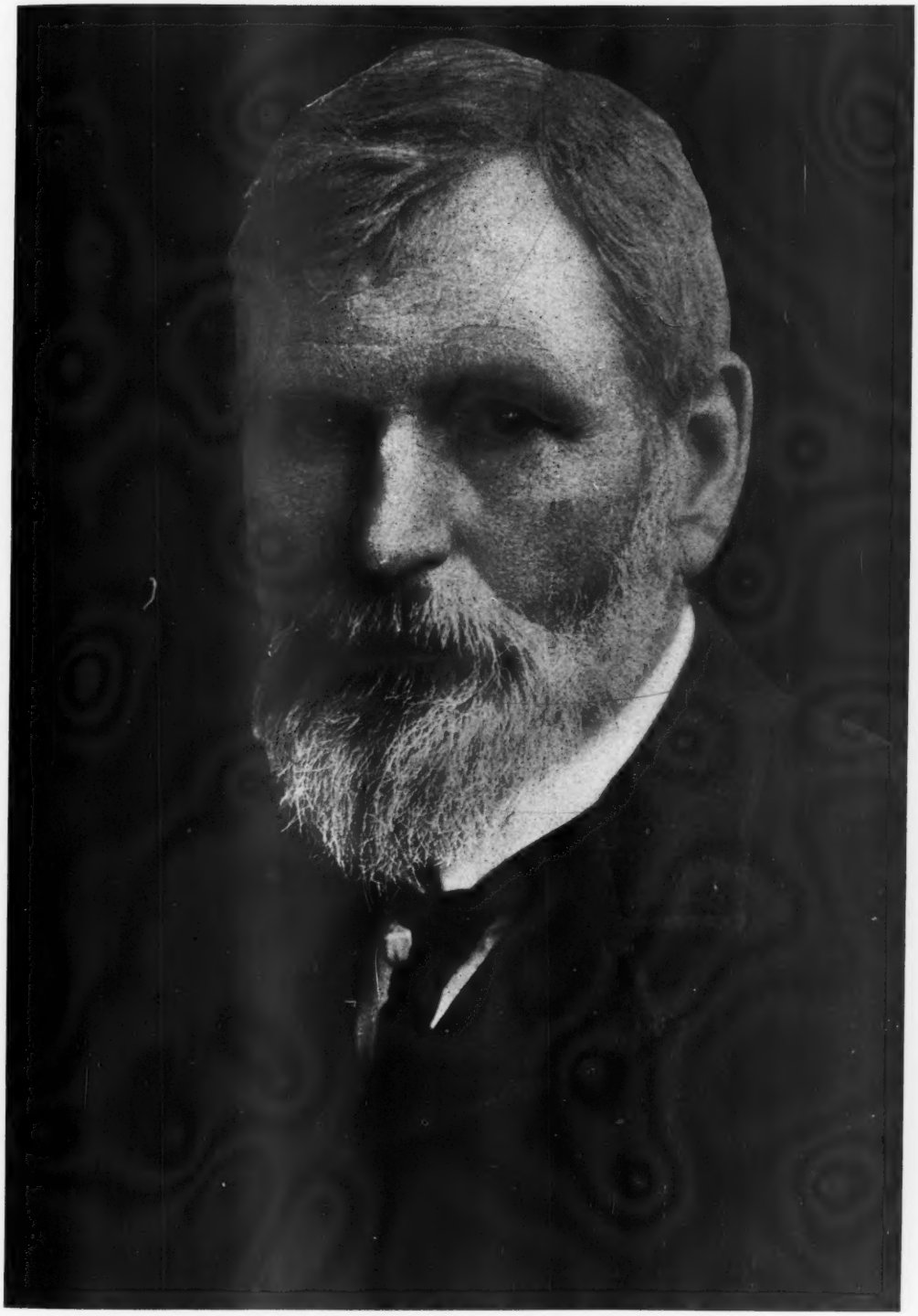
THE decision to build the Panama Canal by contract is applauded in almost every quarter and seems sound.

The Government has no equipment nor experience nor permanent body of fit men for construction work of this kind. It ought to be done under proper contracts with companies that have all these.

One of the strongest points in favor of this plan is the more probable withdrawal of the Canal from politics during the work of construction. Of course, the awarding of the contracts will be watched with vigilance by the people, with the more vigilance because the financial men of the National City Bank of New York will, it is reported, be the backers of one bidder for the whole work; and that bidder is a consolidation of six or more great construction companies doing business in the United States. But the awarding of large contracts to a syndicate under the financial direction of this bank or of any other will meet no opposition, of course, if its bid be the best.

Under one contract, the work, including the profits of the contractors and of the syndicate, if there be one, will probably cost $200,000,000. If the work be well done for that sum and done honestly, we shall have the worth of our money. Financially, it is not a gigantic undertaking for our Government. We have eighty millions of people, most of them prosperous. Canada, with its six millions, has within the past year placed contracts for the building of a railroad to cost about $80,000,000, for which the Government may ultimately be alone responsible.

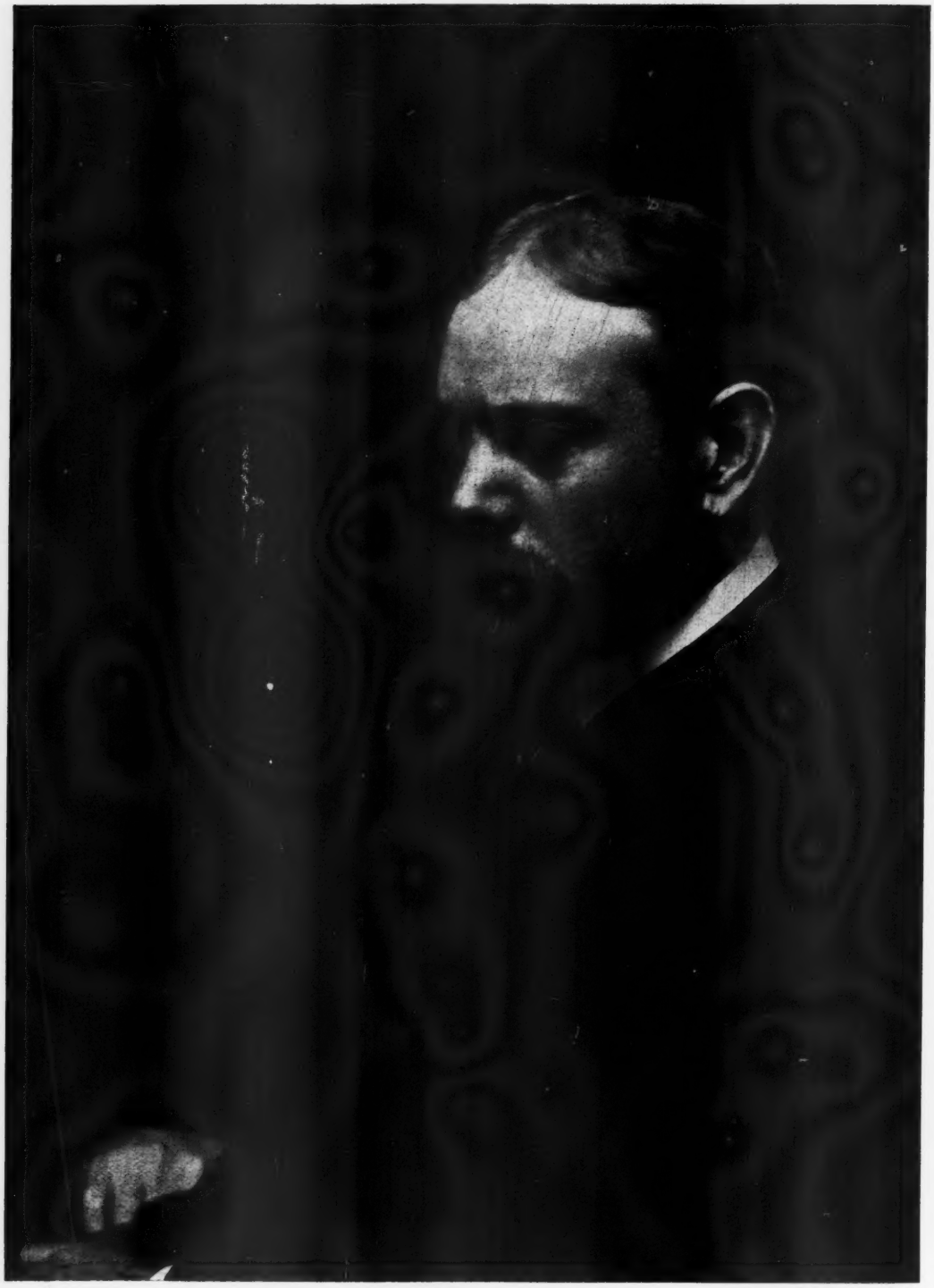
These are, by the way, inspiring spectacles for Old-World economists—the use of Government money, not for battleships and armies, but for the extension of commerce and industry.



MR. HENRY M. ALDEN, EDITOR OF "HARPER'S MAGAZINE" FOR 37 YEARS

"HE HAS DONE HIS TASK THESE MANY YEARS OF MANY CHANGES WITH SUCH SURENESS OF AIM AS TO WIN A SECURE AND HIGH PLACE IN THE ENCOURAGEMENT OF LITERATURE"

[See page 8262]



Photograph by De W. C. Ward

MR. WILLIAM VAUGHN MOODY

PERHAPS THE MOST DISTINGUISHED OF OUR YOUNGER POETS. HIS STRONG PLAY, "THE GREAT DIVIDE," HAS PUT HIM AMONG THE FIRST AMERICAN DRAMATISTS

[*See page 8203*]

THE WORLD-WIDE RACE QUESTION

IN SAN FRANCISCO, certain public schools were set apart by the local authorities for Japanese and Chinese children, who were then excluded from the schools attended by American children. Against this discrimination the Japanese Government made to our Government a polite but firm protest. At the same time, the Japanese cadet at the Naval Academy at Annapolis was ordered by his Government to resign.

With this Japanese protest the best opinion in the United States is in sympathy; for this discrimination against Japanese pupils is in real violation of our treaty with Japan, as well as a breach of courtesy. The President promptly explained to the Japanese Government, through the State Department, that our National Government does not approve of this exclusion, and Secretary Metcalf went to San Francisco to try to end the offense. This assurance quieted the popular resentment that had arisen in Japan.

The incident again calls attention to the anomaly in our system of government whereby a state or even a city has done violence to international relations in spite of the National Government. But the Secretary of State has called attention to Article VI of the Constitution, which seems to cover the case:

"This Constitution, and the laws of the United States which shall be made in pursuance thereof, and all treaties made, or which shall be made, under the authority of the United States, shall be the supreme law of the land; and the judges in every state shall be bound thereby, anything in the constitution or laws of any state to the contrary notwithstanding."

This incident calls attention to a more important fact—that what we call the race-problem is not local but is world-wide. The Negro, the Chinaman, and now the Japanese remind us, in our own borders, of the universality of race difference and race-feeling, and South Africa is wrestling with the same problem. No feeling against the Japanese exists throughout the United States; for Japanese students are and have always been heartily welcomed at most of our colleges, and educated Japanese are received in the social life of the country. Still, a yellow man is a yellow man to the San Francisco school authorities, and wherever a black or yellow race lives in great numbers with the white race there is an ever-present tendency to make offensive distinctions. This apparently fundamental fact may play a large part in international as well as national politics of the future.

THE TRUE VOICE OF THE SOUTH

THE recent race-troubles in the South have called forth plain and helpful words and definite action from good and influential men of both races. In proportion as these assert themselves, trouble will be infrequent. It is important always to understand that these race troubles are caused not by white men nor by black men as such, but by men of either race who lack personal or civic character; for white men and black men of character live peacefully together with mutual respect.

The grand jury of Fulton County, Ga. (in which Atlanta is situated), having previously reprehended the yellow journals of that city, and one of them in particular, has since reprehended the police, saying that if they had promptly done their duty the fatal riot of several months ago would have been prevented. Mere criticism by a grand jury sends no criminal to prison, but it does give expression to the sober voice of the community.

A much more important action was recently taken at Montgomery, Ala. During the State Fair there, one day was given especially to the Negroes; and at a meeting of 3,500 of them a strong resolution was enthusiastically approved in favor of the organization, by Negroes, of law and order leagues. Governor Jelks and Mr. Booker T. Washington made very frank speeches in favor of the plan. Mr. Washington said such things as these:

"We want to stay in the South and the white man wants us to stay here. He sent for us. He paid our passage, and now he wants us to stay."

"A most important subject for us to consider at every fireside is the development of an influence against lawlessness I stand by the Governor of Alabama in everything he has said, and I want you to stand by me."

"The people who give the most trouble are the drunkards and loafers, those who carry pistols and those who hang around low dives. And I must say that in many cases those dives are kept by white men. As to those who carry pistols—where a concealed weapon keeps one out of trouble once, it gets him into trouble nine times. It is the coward who carries the concealed weapon."

And Governor Jelks declared that this speech was "calculated to do more service for Alabama than any similar number of words ever uttered. It was an epoch-making speech."

Meantime in Mississippi the campaign that

has begun for United States Senator, though the election does not take place till next winter, is emphasizing a somewhat new phase of the race-problem. Governor Vardaman, one of the seven candidates, is of course making his campaign on the proposal to repeal the Fourteenth and Fifteenth Amendments; but other candidates are discussing the desirability of bringing in Italian immigrants. What the Senatorship has to do with this subject is not quite clear, but the discussion gives expression to the most important economic topic of that part of the country. Laborers are scarce in Mississippi, as they are in most other Southern States. There are not enough, white or black, who will work, to do the work that waits. In many places in Louisiana, and in at least one place in Arkansas, Italians have shown themselves capable and thrifty. There are those who predict that in many localities they will supersede the Negroes. But in most Southern communities there is a prejudice against them. The people say that they will bring another race problem. But since the cry becomes louder in almost every part of the South for more laborers; and since the Italians are reported to supply the demand successfully wherever they have gone, sheer economic pressure seems likely at last to send many of them to the cotton fields and perhaps to the cotton mills.

This same economic pressure will in time somehow eliminate most of those Negroes and those white men as well who live without labor and who, therefore, have the time and temper to breed disorder and race hatred.

PEARY'S FARTHEST NORTH

ALTHOUGH the popular interest in polar exploration has somewhat waned since so many expeditions which were confidently expected to reach the Pole have failed, much of the old excitement was stirred by Commander Peary's outstripping all his predecessors. He went within 200 miles of the Pole, which is now "farthest north." The Duke of Abruzzi's expedition in 1900 went within 239 miles, and Nansen, in 1895, within 261 miles.

Peary made this last expedition by the help of the Peary Arctic Club, of which Mr. Morris K. Jesup is president and Mr. H. L. Bridgman of New York is secretary; and he sailed from New York on July 15, 1905, in the *Roosevelt*, a ship that had been built for this very purpose, and he reached a high point in the Arctic seas in a shorter time than any other explorer. He left his ship at Grant Land, in the American Arctic, and set out to reach the Pole by dog-sleds. He sledded to a point 400 miles north of his land base, a feat that was never equalled over the rough Arctic ice; for to make this advance north he had to sled a much greater distance in his zigzag journey. Then his farther advance was hindered by open water. Thus he settled one disputed question—whether there be open water that far north. When he had reached his highest point, the ice-pack was broken and he drifted on it eastward—perhaps 200 miles—to the coast of Greenland.

He rescued one party of his men just in time to prevent them from starving, and they ate eight of their dogs. To the usual experiences of Arctic hardship was added the peril of drifting on the ice; and for a second time, Commander Peary owes his life to the musk-oxen that he killed in Greenland.

Whoever may reach the Pole, if it shall ever be reached, Commander Peary has placed himself among the very greatest of Arctic explorers; for, if the ice had not broken under him and drifted eastward, there is every reason to suppose that he would have gone 200 miles still farther north and solved this riddle of the earth. He seems to have proved the hopelessness of trying to reach the Pole by sledding over ice. When it is reached it will be reached by some other method.

OUR REAL TASK IN CUBA

WE SHALL have control over Cuba until next June, when, it is expected, an election will be held under the supervision of Provisional Governor Magoon and the republic will be restored. The period of our direction may be longer than this; but it will not be longer if the Cubans show as strong a disposition to establish their government on a sound footing as the Administration is showing to put it there. There is, of course, a hard task for Governor Magoon to perform before he can lay down his responsibility. Secretary Taft, before leaving, cleaned up the débris of the "revolution" by proclaiming a general amnesty, by disarming the insurgents, and by arranging for the payment from the Cuban treasury of property owners who were despoiled by the "patriots" during their junket in the bush.

But the most significant fact exposed by the miserable affair is not that a "revolution" had

taken place, but that the Cubans had never grasped their opportunity, had never put their house in order. Governor Magoon's task is not to restore a condition. It is to build up a sound government in a community whose attempt at local government has been an exercise in graft, whose national political issues have been "office," and which has confused the ballot with the machete. One of his earliest acts was to visit the National Insane Asylum, which he found in an appalling condition. The immates were shamefully neglected, though funds to maintain them had been provided. He is not patching a roof. He must build a house.

Under General Bell, American troops are thinly scattered over the island, not to interfere, but merely to give moral support to the Cuban authorities. A commission of American expert accountants has been working for some time to straighten out local and national finances with a view to introducing a business system. American advisers, virtually Cabinet officers, were early appointed to help Governor Magoon, and other Americans have been set to work at the general housecleaning. The politicians of the Cuban Liberal party, which conducted the "revolution," were as much disappointed that they were not given the upper hand in the construction work, as the moderate politicians who supported ex-President Palma were disappointed because American intervention did not give them an armed police to serve their partisan ends. Whether Governor Magoon, in putting the government departments on a sound footing and establishing a real election system, will succeed in setting up a permanent self-governing nation depends on the mercurial Cubans, who thus far, when tried, have been found wanting. A remarkable fact about our action is the unanimous commendation of President Roosevelt's intervention throughout, by Americans of all shades of political belief, by European opinion, and even by the Cuban public.

SOME INTERESTING PERSONALITIES

THE selection of Mr. Oscar S. Straus, of New York, as Secretary of Commerce and Labor, has been very earnestly and generally applauded; for he is a fit man, and an earnest man; and (rarer yet) he is an interesting man. His career is an instructive one. Born before his father emigrated to the United States, his boyhood was spent in Georgia, and his manhood chiefly in New York. He is a lawyer by training and by a period of practice, a well-read man, an historical student of a wide range, the author of a number of scholarly books, a successful merchant, a diplomatist (twice Minister to Turkey, once under a Democratic and again under a Republican Administration), an economist of sound methods of thought, and a man of great public spirit. He is also a member of the Permanent Court of Arbitration at the Hague. This is a man to sit at the President's Cabinet table, the more fit because of his earnestness.

It is no offense to say that he is as good a Christian as he is a good Jew, for he is of a liberal faith. Yet the fact that he is a Jew has a meaning—or may have—to the Old World. He happens to be the first man of his race to sit in a President's Cabinet, although Mr. Isidor Straus, his brother, declined the Postmaster-General's portfolio under Mr. Cleveland, and Mr. Joseph Seligman declined the portfolio of the Treasury under President Grant. Mr. Straus has not only the general qualities called for by the post that he will take, but a special fitness for his particular portfolio; for he knows both his commerce and his labor by close study, by personal experience, and by a sympathetic interest in the practical affairs of each.

II

The profound respect in which the public held Mr. Charles E. Hughes, as an investigator of insurance and other evils, warmed into something more when he took the stump in the New York campaign. He was the same merciless seeker for facts, the same logical analyst of evidence, that brought down the insurance house of corruption. But he quickly showed that meeting the public was less alien to him than some of his friends had feared it might be. The voters found him a man with blood in his veins. He showed heart as well as brain and conscience. He rang true. He said one day:

> "I know of but one way to deal with the questions that may be presented and that is this: Find out all the facts; find them out fairly and thoroughly and impartially with reference to every question that is presented for executive action. Then hear what is said on both sides fairly and impartially and try to understand both sides. Find out what the reasonable conclusion is, find out what ought to be done. Then do it and tell the people why."

A brilliant public career may await him; for

he comes of stock distinguished for its unbending character. This is the sort of men now called for—always called for, but especially now when public life has as its chief task the firmer establishment of character.

III

Mr Henry M. Alden, whose seventieth birthday was recently celebrated by a very large part of the literary craft in the United States, is the veteran and dean of magazine editors; and he has done his task these many years of many changes with such sureness of aim as to win a secure and high place—a unique place, in fact—in the encouragement of literature. It would be impossible to estimate the value of the part that *Harper's Magazine* has played in American life under his long editorship of thirty-seven years. It is the oldest of our surviving magazines. The *Atlantic Monthly*, which will celebrate its fiftieth anniversary next year, is older as a magazine of exclusively original matter. But during the whole period of Mr. Alden's editorship, *Harper's* has been a magazine of original contents and it has given to the public many of the best pieces of literature of this long time.

Worthy men are likely to be modest men—a truth that was never better shown than by this veteran editor who has ministered to the instruction and to the cultivation of many reading generations; and yet hundreds of thousands of readers perhaps never even knew his name.

IV

Although the old-fashioned hortatory evangelist is supposed to have passed out of date and been superseded by the kind of man who has his press-agent and literary bureau and other instruments of noise and popularity, the old-fashioned preacher of an earlier time still survives. The late Rev. Sam P. Jones, of Georgia, was such a man.

Though not an orator of the conventional sort, he was a public speaker of rare power. He might have become one of the most famous criminal lawyers of his time. Had he gone into politics, he might just as easily have won a great popular success. But, instead, he dedicated his remarkable abilities to the Power that had lifted him out of the mire of his early life, and became a Methodist minister, and soon a traveling evangelist. His career shows that the pulpit, when an original man is in it, still has its wonderful power. For twenty years the calls for his services far exceeded his physical ability to respond. No church was large enough for the crowds that flocked to hear him. It was never necessary to "bill the town" where he was to preach. Indeed, when he dropped into a city for a single service, an effort was often made to keep the news out of the papers to avoid a crush. As many as ten thousand "men only" have gathered at a single service—a spectacle few ministers have ever seen.

He had no new doctrine—he was a preacher of the old-time religion. Even a creed was to him "the skin of the truth, dried and stuffed with sawdust." For biblical research he had scant respect, and none at all for "the new theology," and he knew little about either. He was profoundly grateful that he had not been "prepared" in a theological seminary. He ridiculed sectarian differences. Speaking once of "free will" and "election" in an informal gathering of theologians, he said: "We Methodists know we've got religion, but we're mighty afraid we'll lose it; you Baptists know you can't lose it, but you're mighty afraid you haven't got it."

Having suffered in early life from drink, he made no compromise with this old foe. "Red liquor and Christianity won't stay in the same hide," he insisted. Many remarkable things happened during his crusades. In Nashville, Tennessee, a prominent wholesale liquor-dealer went from one of his meetings, emptied into the sewer every barrel of his stock, gave his warehouse to the Salvation Army, and headed the movement which built a great tabernacle. The man's subsequent life proved that it was not the mere impulse of the moment.

Whether in the pulpit or out of it, Sam Jones feared nobody. On occasions, an angry gambler or saloon-keeper met him on the street and insisted on having personal "satisfaction"—and got it. He had a way of using "straight-flung words" without leaving a sting. In Louisville, for instance, the night after Derby Day, a number of race-horse men were in the audience. As the collection-box started on its rounds, the preacher walked to the edge of the platform: "Some of you men were at the races to-day," he said, calmly, "and haven't anything to put in. You can just sit there and feel like a dog—and feel natural." But he said it in such a way that the response was generous. Again, in reply to criticism, he said: "You old hens cackle all day about the

things I say, but you are roosting here on the seats again before sundown."

Once, in a gathering of younger preachers, he illustrated his ideal of a minister's character. He told of a dream wherein he had been confronted with a promissory note several years overdue, which he could not legally be required to pay. But he paid it—and woke up. "I have been proud ever since," he added, "to think that I wouldn't do a mean trick even in my sleep."

V

The actable drama—worthy to be called drama—is, perhaps, the most difficult form of composition. It is an event of importance, therefore, when a new playwright appears, especially a new playwright of high literary craftsmanship. Mr. William Vaughn Moody, who is, perhaps, the most distinguished of the younger American poets, has made a new epoch in his own literary career and perhaps a new era in the American theatre, by his play "The Great Divide." He has hitherto written verse, including dramatic poems; but they were echoes of the old poets—at any rate he took old themes, such as the Promethean story in his "Fire-Bringer." But "The Great Divide," which is in vigorous, terse prose, is a play made out of American life and deals with the primary passions at first hand.

WAS PROFESSOR BURGESS RIGHT?

A SPEECH consists of two things—what the speaker says and the occasion on which he says it. At least this will serve as a good working definition for the present use. Professor Burgess, of Columbia University, in New York, might any day have said in his own lecture room, or anywhere else in the United States, that our high protective tariff and the Monroe doctrine are obsolete; and the peace of the world would not have been threatened. But when, as "Roosevelt Lecturer," he said this in his opening lecture at the University of Berlin, when the Emperor was one of his hearers, the civilized world found itself divided into two parts—those that were amazed and vexed, and those that laughed.

Of course he spoke only his own opinion; but the occasion gave his opinion a certain authority, in courtesy if not in fact. There had been much international formality indulged in when an exchange of German and American university lecturers was arranged. The President and the Emperor had taken a keen and courteous interest in the plan, and this lectureship, endowed by Mr. Speyer, an American of German descent, was named for the President. Speaking, on such an occasion, about subjects of present and possible controversy between these two Governments, was, therefore, a bad error of judgment.

In the comment made in the United States on these declarations by Professor Burgess, it is interesting to observe that his declaration about protection has been very generally applauded or received with a smile, but that his declaration about the Monroe doctrine has been generally resented. It is probable that this comment gives a fair hint of the direction of American opinion.

LANDMARKS IN CORPORATION RESTRAINT

SECRETARY ROOT, in his exceedingly forceful speech during the campaign at Utica, N. Y., made a convenient summary of three important principles which have been established by Supreme Court decisions during Mr. Roosevelt's Presidency, in relation to the enforcement of Federal laws against trusts that violate them:

I. "The Supreme Court has denied the claim of the trust corporations to be exempt under the Constitution from furnishing testimony against themselves by the production of their books and papers before a Federal Grand Jury. Thus the protection of secrecy for corporate wrongdoing is beaten down."—(*The Tobacco Trust case—Hale vs. Henkel.*)

II. "The Supreme Court has held that a wrong accomplished by means of incorporating in accordance with the express provision of New Jersey statute was just as much a violation of Federal law as if there had been no incorporation. Thus the state rights defence of protection from favoring state statutes is beaten down."—(*The Northern Securities case.*)

III. "The Supreme Court has held that although the business of manufacture is carried on within the limits of a single state, yet the purchase of the raw material in different states and the sale of the finished product in different states brings the business within the interstate commerce clause of the Constitution and gives the Federal Government authority over it. Thus the defence that the state alone can deal with manufacturing corporations, however widespread their business, is beaten down."—(*The Beef Trust case.*)

These three decisions have cleared away three great obstacles that stood in the way of punishing offending corporations by the Federal Government; and they may almost be said to have brought a new era in the possibilities of restraining them from wrongdoing.

A DARK SIDE OF CHRISTMAS

AN INVESTIGATION recently made in New York City under the direction of several charitable and philanthropic organizations reveals a dark side of Christmas. There are those to whom it brings woe instead of cheer. The women and children of many factories and shops from which Christmas wares come to gladden the fortunate, find the season only a period of overtime work. Miss Van Kleeck, one of the investigators, says in her report that in New York City alone more than 130,000 women are at work in more than 39,000 factories. The best conducted factories have shown how good conditions of work may be provided—with profit as well as with humaneness. But many keep their workers in dark, ill-ventilated, and unclean rooms; many women and children must stand all day, many operate dangerous machines, and most work at high speed. And such pictures of pity as the following darken the report with a kind of hopeless gloom:

"Paper boxes are an important part of the Christmas trade. In a paper-box factory in New York City, a girl operates the cutting machine. To keep one's hands clear of the stroke of the knife requires constant watchfulness, yet no protection is provided. The guard, which was invented to prevent accidents, limits the output by one-half, and the girl would be discharged if she used it. In rush seasons, this girl and all the others in the factory (they number three or four hundred) work from 7:45 A. M. until 8:00 at night, with a half-hour for lunch and no time for supper. On Saturday they stop at 4:30 in order that the cheapest girls (who earn $2.50 a week) may have time to clean the machinery. They frequently work on Sunday, making a total of more than seventy hours in a week. To the question 'Would you be discharged if you refused to work overtime?' the answer was 'Yes.'

"A candy factory works from 7:15 A. M. until 7:45 P. M., with one-half hour for dinner and no time for supper—twelve hours in a day, five days in the week. On Saturday, they work until 6:45 P. M.—eleven hours—seventy-one hours in the week.

"In a cigar factory, the women work from 7:00 A. M. until 7:00 P. M., and on Saturday until 5:00 P. M. The workers live in the neighborhood. Promptly at twelve they rush from the factory for dinner, returning to work after fifteen minutes or less. They are piece-workers, and they must lose no time or their wages will be very small. Their working weeks in the season preceding Christmas are nearly seventy hours long."

Are there not laws? Yes, and some good laws, though not enough. But there are fifty factory inspectors in the State of New York and there are 78,000 factories.

But the final force that will win us to humane ways lies behind the laws—it is the force of a public opinion that stops, while we are doing our work or while we are enjoying our festivities, long enough to take within the range of its protection the victims of a system to which we easily become accustomed and hardened. Every man must first wake himself up to know what goes on around him. Then he can wake up others.

THE NEW WONDERS OF COMMUNICATION

THE beginning of the new year will see the greatest revolution in transportation since the stage-coach gave way to the railroad train—in the substitution of electricity for steam on two of the greatest railroads entering New York. This installation is but the first step in a great change. Wireless telegraphy is just becoming a commercial success, and it has miraculous possibilities. The turbine opens a new era to steamship travel. The flying machine may be on the point of practicability. Within our own lives we have seen notable advances in means and methods of communication, but we are entering a day of far greater wonders.

THE WORLD'S WORK has been gathering the stories of those "chosen men of strength," the miracle-makers who are "tossing the miles aside," and these articles are so rich in interest and suggestiveness that they will be grouped in a special number of the magazine—the number for January, which will be devoted, in the main, to the new wonders in communication. It will explain the recent improvements in railroading, ocean transportation, telegraph, and telephones; it will have stories of travelers and observers; it will tell of the men who are bringing about the revolution in communication and of the way they are doing it.

In this number will be begun also a series of articles about Mr. E. H. Harriman, his personality, his methods, his ambitions; the deeds that he has done, and their results. This will be the first serious effort to analyze this most remarkable of the railroad rulers and most inscrutable figure before the public; to tell the story of his life and achievements and to measure the scope and the value of his work. These articles will throw a strong light into several mysterious corners of the railroad, financial, and political worlds.

McIVER, A LEADER OF THE PEOPLE

GLIMPSES OF THE CAREER OF A MAN WHO SHOWED THE SOUNDNESS OF AN UNBOUNDED FAITH IN OUR DEMOCRACY AND HELPED TO WORK A POPULAR REVOLUTION IN HIS STATE

BY

WALTER H. PAGE

AS A CHRISTMAS story for good men and women (for the story of a noble and helpful life is the best thing in the world to know), I shall try here to write a short explanation of the work and of the character of Charles Duncan McIver, who died in September and left those who knew him bereft of a most cheerful presence and helpful companionship. He was so definitely helpful a man and he had such a sound view of life that the memory of him is better than all sermons on conduct; and, though his death is a great sorrow, the things that he did and the way in which he did them and the things that he said, both the wise things and the humorous—and the humorous were also apt and wise—make the task of right living, of sound thinking, and of cheerful working easier than they would have been without him. Wherever and whenever there has been a man about whom this could be truly said, the simple story of his life is both an inspiring and a pleasant thing to tell—if one had the power really to tell it adequately.

Dr. McIver spent his whole life, after a few years of early apprenticeship, in the public school service of North Carolina; and he had just finished his twenty-fifth year of labor when he died, at the age of forty-six. For fifteen years he had been the president, as he was the creator, of the State Normal and Industrial College for women. Thus the events of his life were in a way uneventful and his career, remarkable as it was, is likely, with the best telling of it, to seem commonplace to those who did not know him. It is hard to show why an apparently routine career of faithful work was one of the noblest examples of living that you will find in our time.

It must first be said that he was one of the cheerfulest men in the whole world. He beamed good humor so that he made you better content with your lot. I know a household that he used to visit; and not long ago the children were making plans to do various things and to go every one on a different errand of pleasure, when one of them suddenly stopped and said: "Oh no! not that evening. Dr. McIver is coming then and he's more fun than anything else." His coming was an event to any company. This means that he was an interesting man, so interesting that he keeps a firm place in the memory of everybody who had ever met him. Any one who knew him could give a dozen explanations of his quality of being interesting—that he told apt stories in his conversation, that he talked about the subjects that you wished to hear him talk about, that he was earnest and humorous and sincere; and all these explanations are true. But the deep secret of his hold on you was more than these—it was the largeness of his nature and his sympathetic attitude to *you*, no matter who you are. Perhaps no human creature ever came in contact with him who did not feel that they had much in common. You have much in common with persons of your own class and tastes, but how much have you in common with persons of very different experiences and tastes from your own? He was at home with every kind of persons, so big and fundamental was his nature.

His great-grandfather was a Scotch immigrant to North Carolina—a farmer of course; and his grandfather and his father were farmers. They were sturdy, God-fearing, well-to-do people of the staunchest character. But in Dr. McIver's boyhood, which fell in the troubled times after the Civil War, his father was poor, as all his neighbors were; and the son during his youth did all kinds of farm work. He plowed and gathered the crops, he cut wood, he did all things that fall to sturdy farm lads in a simple and right minded rural community where work is honorably regarded. He looked

upon such work and upon all work as only the wisest men look upon it, and he so regarded it all his life. A man who plowed his field well and who with his own hands curried and fed his own mule well was (really and not as a mere doctrine) as worthy a worker as any other man of any other calling who did his work well. He was prepared—somewhat ill-prepared—for college at a school in the backwoods neighhood of his boyhood; and, when the time came and he had secured a county scholarship at the State University, he drove with his father the thirty miles to Chapel Hill. He had hardly been away from home before, and he had never before been thrown with a crowd. He met his fellows and his teachers with an eager, earnest, wide-eyed wonder—the world was opening before him!

His contemporaries tell how almost immediately everybody came to know him and to like him. He was from the beginning a presence and a force. You cannot find a man who was in college with him and who does not distinctly remember him from the first day he met him. He did his work well—a serious, industrious, conscientious lad who was in grim earnest. But he was the cheerfulest fellow and the best story-teller of his time; and, without knowing how or why, he almost immediately became a leader among his fellows. And from that day till the day he died, he was a leader in every movement, and the originator of many movements to build up the University. This institution, as every other that he touched, owes him a lasting debt. Twice he might have become its president, but he had found work that he regarded as of more fundamental importance to society.

In a normal state of political society, he would doubtless have found his way into political life. But there was not a normal political society then in North Carolina; and he began to teach in a private school for boys in the town of Durham, in order to pay the debt that he owed for his college career. The public school system was then held in prejudice in the state and in the town; but the first vote that he cast was a vote for a local tax for the public schools, although the public schools would destroy his private school. He never put a private interest against the public good.

After several years of teaching in several private schools—the last a school for girls—he had worked out a plan for the education of all the people with which he took fire and blazed till the end of his life. North Carolina was then one of the most illiterate states in the Union. He saw that the public school system must be developed so as to reach all the people; and he saw that teachers must be trained for it. Then he discovered that there was no proper provision for training the young women of the state for teaching or for anything else. There were a few private and church schools for girls, but they could not reach the masses of neglected women. For nearly a hundred years the state had had a university for boys, but it was then utterly neglecting the girls. The burning shame of this neglect gave his career definite shape and made him an apostle, or a crusader, for the rest of his life. As a great leader of the people he worked and fought for the rest of his life for this proposition:

> "When a man is educated it is simply one more taken from the lists of ignorance, but in the education of a woman the whole family is taught, for she will pass on what she has learned to her children. The education of one woman is far more important for the world's advancement than that of one man."

By his devotion to this doctrine, he built a great state school for women; he revolutionized the educational work of the state; and he eloquently pleaded this cause in public addresses in half the states in the Union.

By his agitation a bill was introduced in the legislature to establish a state college for women, but the religious sects, and other friends of private schools for girls, and the more or less general indifference to the subject caused its defeat. But that legislature did make a small appropriation to conduct "teachers' institutes"; and one of the most remarkable campaigns in American history then began—a campaign that set forces going which in twenty years have changed North Carolina from a backward illiterate commonwealth to one of the most energetic and eager educational communities in the country.

Charles D. McIver and Edwin A. Alderman, classmates and friends from the first, were appointed to hold these institutes all over that large commonwealth. It was a stump campaign for popular education, the like of which perhaps was never known before and has never been heard since. They met the public school teachers in schoolhouses, in courthouses, wherever convenient, and for the first four days of the week instructed them in teaching. Then Friday was "people's day." The whole neigh-

borhood was invited and speeches were made to arouse the public. The next week this programme was repeated in another community. Thus these two young men, one in one part of the state and the other in another part, came to know the people as few men knew them. It was by this work that they trained themselves to public speaking, and they both became, each in his own way, among the most effective public speakers of our time. When Mr. McIver did accomplish the establishment of the state school for women, Mr. Alderman became a member of the faculty, later a professor in the State University; subsequently its president; then President of Tulane University in New Orleans, and later of the University of Virginia, which post he now holds.

For the next session of the legislature did appropriate money to establish the college for women, and Mr. McIver was chosen as its president, and as its president he died. Within fifteen years 3,000 young women attended the college and they have taught more than 200,000 children in the public schools.

Dr. McIver's monument is this school. But he was born to work with large masses, to be a leader in a democracy. He was a schoolmaster of the people. He knew everybody. He took a part in every good movement. Many men have earnestness and some have humor. Once in a long while nature gives both these qualities in proper proportion to the same man, and thus she makes a man that is invincible. This bountiful endowment made Mr. McIver "the foremost citizen of his town, the foremost citizen of his state, one of the most useful men in the Republic." He had been president of the Southern Educational Association and he would probably have been the next president of the National Educational Association. He was a member of the Southern Education Board and the chairman of its "campaign committee" which directed a campaign for popular education in several southern states, all the other members of the committee being men also engaged in educational work in those states. He organized everything that he touched—an association of women, for instance, to improve the public schoolhouses. He continued to stump his state and other states for the betterment of the public schools; and during a few years of his activity a new schoolhouse was built in North Carolina every working day. He had opportunities thrust upon him of making a large income if he would give his time to industrial pursuits; he had offers of more lucrative professional positions than the one that he held. But he kept his own self-made place of leadership, with its pitifully meagre income, much of which he gave away to poor students, to movements for civic improvement—to every person or cause that meant the building-up of the people. For he believed in the people with as deep a conviction as any man ever had.

There is at the college a mass of such literature of a people's aspirations, gratitude, and affection as few men's work and death have called forth—autobiographies of women who were helped by him from hopelessness to usefulness and happiness—"human documents" so pathetic and yet so inspiring that a man cannot read them without shedding tears and having his faith in his fellows quickened. They say over and over again: "He did me a greater service than any other human being did." One woman wrote of him as "the state's greatest benefactor, the supremest friend of womankind, the kindliest heart."

A friend who went with him to Europe a few years ago tells these stories:

"Just as we were about to leave London on our way home, I went with him into a clothing store. He bought a very loud, checked English waistcoat. 'What on earth are you going to do with that?' I asked. His reply was: 'I couldn't think of anything that would please Zeke better.' Zeke is a Negro janitor at the college and he had been in Dr. McIver's service for twenty years.

"One of the McIver family Negroes, named Giles, worked on the college farm. Giles sometimes got drunk. Once his bibulous habits got him into trouble and he ran away and nothing was heard from him for some time. One day Dr. McIver received a letter from him from Norfolk, Va., asking for a loan of $30. He did not wait to write. He telegraphed the money. A few mornings later, Giles was discovered at work at his old duties on the farm as if nothing had happened. Nobody knew when he came. Nobody asked explanations. Of course he paid the money back."

With a definite philosophy of human improvement, with a cheerful, balanced view of life, here was a born leader in a democracy who really believed in the people, and who proved by leading an educational revolution (it has been nothing less) that an uncompromising faith in them is abundantly justified.

The Children's Song

By Rudyard Kipling

Land of our Birth, we pledge to thee
Our love and toil in the years to be,
When we are grown and take our place,
As men and women with our race.

Father in Heaven who lovest all,
Oh help Thy children when they call;
That they may build from age to age,
An undefiled heritage!

Teach us to bear the yoke in youth,
With steadfastness and careful truth;
That, in our time, Thy Grace may give
The Truth whereby the Nations live.

Teach us to rule ourselves alway,
Controlled and cleanly night and day;
That we may bring, if need arise,
No maimed or worthless sacrifice.

Teach us to look in all our ends,
On Thee for judge, and not our friends;
That we, with Thee, may walk uncowed
By fear or favour of the crowd.

Teach us the Strength that cannot seek,
By deed or thought, to hurt the weak;
That, under Thee, we may possess
Man's strength to comfort man's distress.

Teach us Delight in simple things,
And Mirth that has no bitter springs;
Forgiveness free of evil done,
And Love to all men 'neath the sun!

Land of our Birth, our Faith our Pride,
For whose dear sake our fathers died;
O Motherland, we pledge to thee,
Head, heart, and hand through the years to be!

From "Puck of Pook's Hill"
Copyright, 1905, 1906, by Rudyard Kipling

ABOUT BUYING BONDS—ARE THEY NOW CHEAP?

THE months of December and January are months in which the demand for good investments comes in great force. The reason for this is that on January 1st a very large number of the bonds and stocks owned by the people pay their interest or their dividends, and much of this money comes back for investment. The total amount of money to be paid out in this way on January 1st cannot be estimated, but the principal bonds and stocks that are dealt in on Wall Street will pay out from $135,000,000 to $145,000,000 in interest and dividends on that day.

Every person who is an investor, or who might become an investor in bonds at this season wants to find an intelligent answer to these questions: Is the present a good time to buy bonds, that is to say, a time when the bonds bought are not likely to drop in price? If so, what bonds are the best to buy at this time?

To answer these questions, one must study the market for bonds very carefully. If a coffee dealer, for instance, wants to discover whether the present be a good time to lay in his supply of coffee for the trade of the next six months, he goes to the great coffee markets, gets the present prices of the various grades of coffee, then compares these prices with the prices at various periods during the past few years. If the prices to-day are the highest in the period that he reviews in this way, he decides not to buy much coffee. If the prices be the lowest in the period, he feels pretty safe in laying in a good supply. He carefully studies the movement of the prices through the whole period, asking why the prices went up in this month, why they went down in that month.

Apply the same good business principle to your buying of bonds or of stocks. It is the only safe way to buy either of these things. Such a study will often save the investor from coming in on top of a boom, to buy stocks, bonds, real estate, or any other form of investment at the highest price, only to see them go down in value after he has bought them. Take the record of the stock market, or the bond market, or the real estate market, and study it just as you would study the coffee market, if you dealt in coffee.

Not everyone can make a study of the market for bonds, because the bond business is hidden in a lot of technical names and kept covered up in various ways, so that the average investor feels that in buying bonds he is buying something mysterious, something he need not understand. Good business men, who would not blindly buy any kind of merchandise without a careful examination, will put tens of thousands of dollars into bonds or stocks, without any knowledge whatever of the bond, or the stock, but merely on the "say-so" of some broker or banker, or perhaps of an accidental acquaintance met on the train.

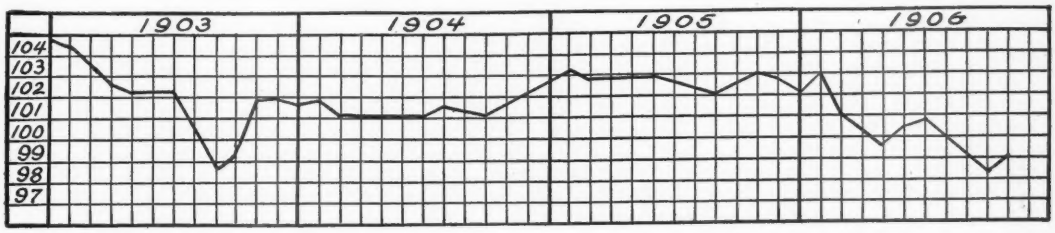
In this article, the movement of the various kinds of bonds on the New York Stock Exchange is shown for the past four years. The diagrams which accompany it are made up in this way: seven bonds of each class are taken as examples; their prices on the first day of each month in the four-year period are put down, and the amount of interest included in the price is subtracted; the prices are then averaged, by adding them together and dividing by seven. The movement of the line in the chart shows the fluctuation in the average price of these seven bonds month by month through the four-year period.

The classes of bonds, and the examples chosen for this series of diagrams may be briefly outlined. The classification is about the one that will be accepted in any market where men deal in bonds.

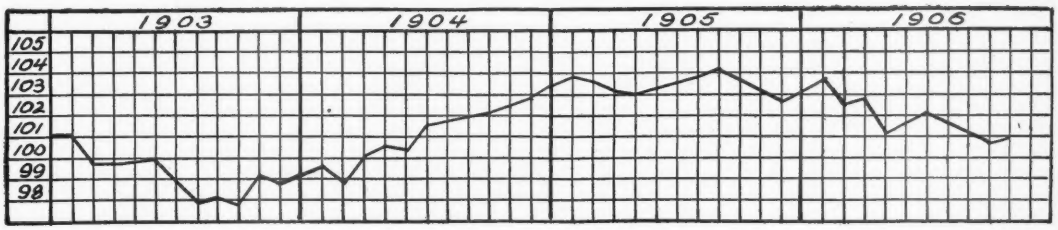
Gilt-Edge bonds. These are bonds that can be bought by any savings bank or any trustee of an estate in the state of New York. They are about the highest grade of railroad bonds known in this country.

[The seven bonds used in diagram No. 1 are: Chicago Burlington & Quincy, Illinois Division, 3½ per cent.; Chicago, Milwaukee & St. Paul, general 4 per cent.; Chicago & Northwestern, general 3½ per cent.; New York Central, first 3½ per cent.; Lake Shore, first 3½ per cent.; Pennsylvania, real estate 4 per cent.; and Illinois Central, first 4 per cent. bonds.]

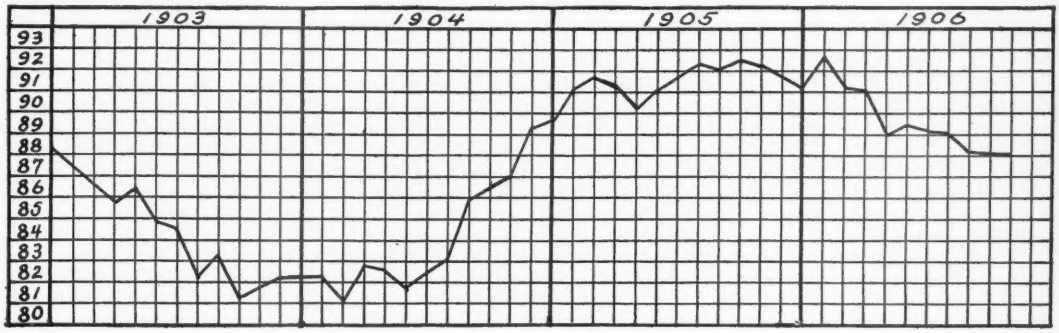
No. 1. GILT-EDGE BONDS



No. 2. HIGH-GRADE BONDS

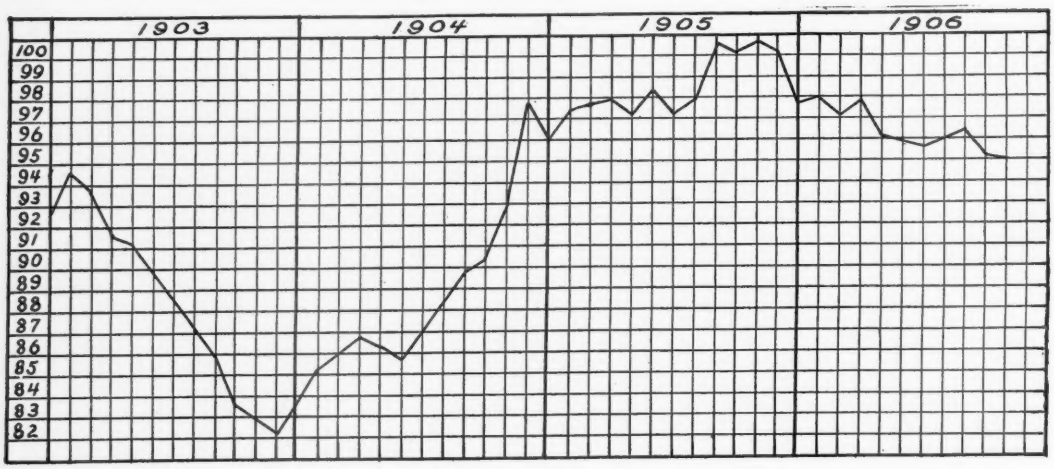


No. 3. MIDDLE-CLASS BONDS



No. 4. BUSINESS MEN'S BONDS

No. 5. INDUSTRIAL BONDS



High-Grade bonds. These are not savings bank bonds, but may be taken by the most conservative private investor, being secured by good railroad property under a mortgage.

[The bonds used in diagram No. 2 are: Atchison, general 4 per cent.; Cheaspeake & Ohio, general 4½ per cent.; Reading, general 4 per cent.; Erie, prior lien 4 per cent.; Louisville & Nashville, unified 4 per cent.; Union Pacific, first 4 per cent.; Northern Pacific, prior lien 4 per cent. bonds.]

Middle-Class bonds. These are safe investments for the average buyer, and are the issues in which about three-fourths of the real investment buying will be found.

[The bonds used in diagram No. 3 are: Colorado & Southern, first 4 per cent.; Erie, general 4 per cent.; Great Northern—Northern Pacific, collateral 4 per cent.; St. Louis & San Francisco, refunding 4 per cent.; Wisconsin Central, first 4 per cent.; Missouri, Kansas & Texas, second 4 per cent.; Seaboard Air Line, first 4 per cent. bonds.]

Business Men's bonds. Investments that one should not buy except as a business risk, being rather speculative and inclined to fluctuate very widely.

[The bonds used in diagram No. 4 are: Rock Island collateral 4 per cent. of 2002; Colorado Midland, first 4 per cent.; Fort Worth & Rio Grande, first 4 per cent.; Mexican Central, consolidated 4 per cent.; St. Louis Southwestern, consolidated 4 per cent.; Toledo, St. Louis & Western, 4 per cent.; Peoria & Eastern, income 4 per cent.]

Industrials. Varying from very conservative to the most extremely reckless kind of investment. In general, the most conservative buyers will find it well to leave these bonds alone. The majority of them are purely risks for a business man to take, and to take very carefully.

[The bonds used in diagram No. 5 are: Metropolitan Street Railway (N. Y.), refunding 4 per cent.; People's Gas (Chicago), consolidated, 6 per cent.; Western Union, funding and real estate, 4½ per cent.; American Spirits, 6 per cent.; American Hide & Leather, 6 per cent.; Consolidated Tobacco, 4 per cent.; United States Steel, second 5 per cent. bonds.]

What is shown by these diagrams? The average reader, looking over them, will be struck first by the wide difference between the present position of the different classes of bonds, as compared with January, 1904. The gilt-edge bonds are lower in price by more than six points, while the high-class bonds are practically the same as at that date. This is a very strange fact, and calls for some explanation. The fact is that the gilt-edge bonds alone of all the classes are lower than they were in the panic of 1903. This panic is represented by the big dip in the line, running from January 1903 to about the end of the year.

These two classes, gilt-edge and high-class bonds, are the securities that should be bought by people who are trustees for estates, or who desire the most conservative class of investment. Is now a good time for such people to buy?

The diagram shows that these gilt-edge bonds can be bought considerably below the average price of the last four years. They are not,

therefore, likely to decline much further except under extraordinary conditions. The trustee or the very conservative investor who goes looking for such bonds at the present time is almost certain, within the next two years or less, to see that his investment has been a profitable one. It will not probably show any large profit, but such investments are not supposed to show large profits. The income is absolutely certain, so far as income can be made so.

The year 1906 has been a bad one for these bonds. There has been, as shown in the diagram, a big decline since February, 1906. The most important causes of this decline were the fact that the fire insurance companies and the savings banks were both called upon for cash in large quantities this year, the former through the San Francisco disaster, and the latter through the big boom in real estate, and the great amount of money put into business all over the country. This decline has probably made a real opportunity for the conservative investor to get the best bonds cheap.

The sharp rise in gilt-edge bonds in October was due to a technical cause. Secretary Shaw allowed the national banks to put these bonds in place of government bonds to secure deposits of government money. Consequently, a few national banks suddenly bought large blocks of the gilt-edge bonds, but no others.

The middle-class bonds are a little higher than they were in the winter of 1902–03. They are much higher in price than they were in the great decline of 1903–04, when investors all over the country were throwing their bonds overboard because they were frightened. Yet the average investor will find it possible to buy these bonds about four points cheaper than he could have bought them last February. In other words, by waiting from February to December, he has saved about as much money as he would receive in a year as interest on his investment.

Are these bonds cheap? Considering that the gross earnings of the various railroads which they represent are from 10 per cent to 50 per cent. more than they were in 1904, they are to be regarded as selling at conservative prices. The decline in 1906 has probably brought them to a point where a man can buy them with confidence that he will see them increase in value within two years. It cannot be said that the indications show that they are now at the cheapest point they will reach. They may decline sharply at the end of the year, if the rates for money go up, because very often men sell a lot of these bonds to get money to loan to Wall Street brokers when these brokers are forced to pay large interest rates. The decline of these bonds at the end of 1905 was due to the fact that Wall Street brokers were paying as much as 100 per cent. for the use of money.

The business-men's bonds and the industrial issues are not recommended to the average investor. The diagram will show at a glance that these two classes of bonds are exposed to wide and sudden changes in price. In ten months ending December 1, 1903, they declined over twelve points. Their recovery was almost as rapid. The line that indicates their prices is very irregular, very uncertain, and quite impossible to estimate. Such bonds, as the chart shows, are subject to sudden movements, caused by influences that belong to Wall Street entirely, and have nothing to do with the real value of the bonds.

People who know the bond business well enough to deal in these bonds, and such people are to be found mostly in Wall Street, must be prepared to take chances. These diagrams show beyond all doubt the danger that lies in buying these speculative bonds. The lesson of the charts is plain enough. If any investor who does not know the Wall Street market very well feels that he must have a large return on his money, and feels that he would like to take his chances in these business-men's bonds, he should open an account with a thoroughly reputable bond dealer, whose advice will be unbiased and honest. If a man, not knowing these bonds very well, goes ahead in the market without the best of advice, he is doing little more than gamble with his money. The same remark applies to the stock market.

These charts should be to the investor what the price lists are to the coffee merchant. They should show pretty well whether or not the especial bonds this investor wants are higher or lower than they have been in the recent past. The coffee merchant, looking over his lists, may discover a sudden rise at some particular time, then a sudden drop, then a long period of level prices. He will cast his mind back over the time, to see what caused those changes. Perhaps he will then take cognizance of present conditions, to see whether such changes are not possible at the present time.

The investor in bonds, looking over the

charts, notes a great dip in 1903, a sudden rise in 1904, a period of level prices at a great height in 1905 and a sudden decline in 1906. His natural question is, "What caused those changes in the whole market at once? Are there likely to be more such sudden changes as came in 1903, or 1904?"

Briefly, the great decline of 1903 was due to what has been called a "rich men's panic." There had been in 1901 and 1902 a huge amount of financing and a great deal of gambling on Wall Street. The people of the world became afraid of American stocks and American industries. There was such a long steady decline in the amount of business that the Steel Trust, the Car Trust, the Corn Products Trust and twenty other great industrial companies either passed their dividends or defaulted their interest or actually went into bankruptcy. Public confidence was shaken terribly. The bankers held great amounts of bonds of all sorts, and in many cases had to sell them at any price. These were the causes of the great decline in 1903. The big recovery of 1904 marked the return of confidence.

The year 1905 showed the result of this great confidence. The chart shows that prices did not go up very much in that year, but that they were high all through the year. It was a remarkable period. At the beginning of the year, the bankers discovered that there was an immense amount of money in the country waiting for investment. In fact, the shrewdest of the bankers had discovered it long before, and had brought here a large issue of Japanese bonds, which they sold to the people. Then came other bond issues, because the people had plenty of money, until more than one thousand million dollars of bonds had been sold to the investors and the banks.

This was the condition at the beginning of 1906, and the people began to fear that the great panic of 1903 might be repeated. It was some such feeling that caused the decline in February of this year. Then, in April, came the San Francisco disaster. It caused a loss of over $100,000,000, and brought a great deal of selling of bonds. From that time until well on into October, the bond market was very quiet, no one wanting to buy bonds until he saw whether the country were all right.

EXPERIENCES IN BALLOONS

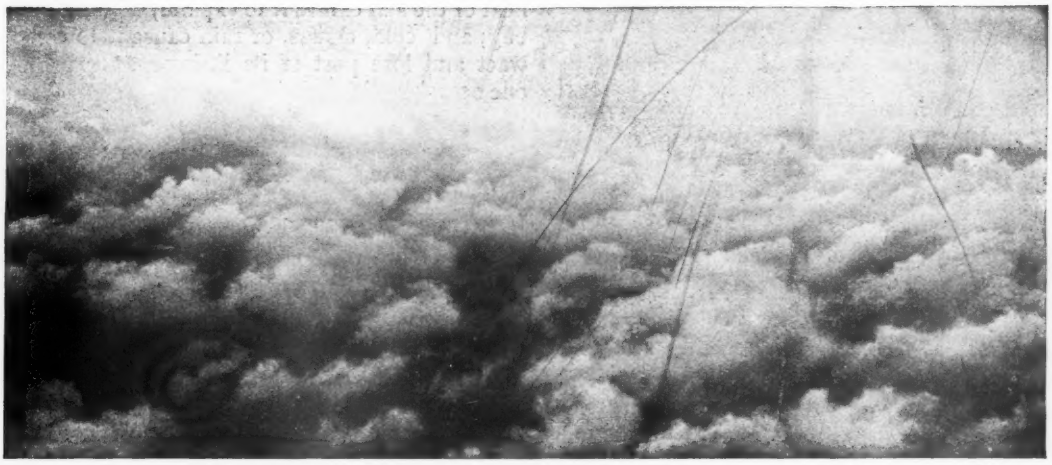
THE PERSONAL STORY OF AN ENTHUSIASTIC BALLOONIST WHO MAKES CONSTANT ASCENSIONS FROM NEW YORK—HAIRBREADTH ESCAPES IN FOLLOWING A NOVEL SPORT

BY

DR. JULIAN P. THOMAS

I HAVE always been interested in exciting sports, especially those of rapid motion. From riding bronchos, I turned to automobiling, and finally to automobile racing. But something was lacking. So I began to frame theories of flying, and to try experiments with model hot-air balloons, gas balloons, aeroplanes, and direct-lifting devices, till it struck me that the experiments would never amount to anything unless I went up and tried my experiments in the air. Forthwith I ordered a large balloon from Paris.

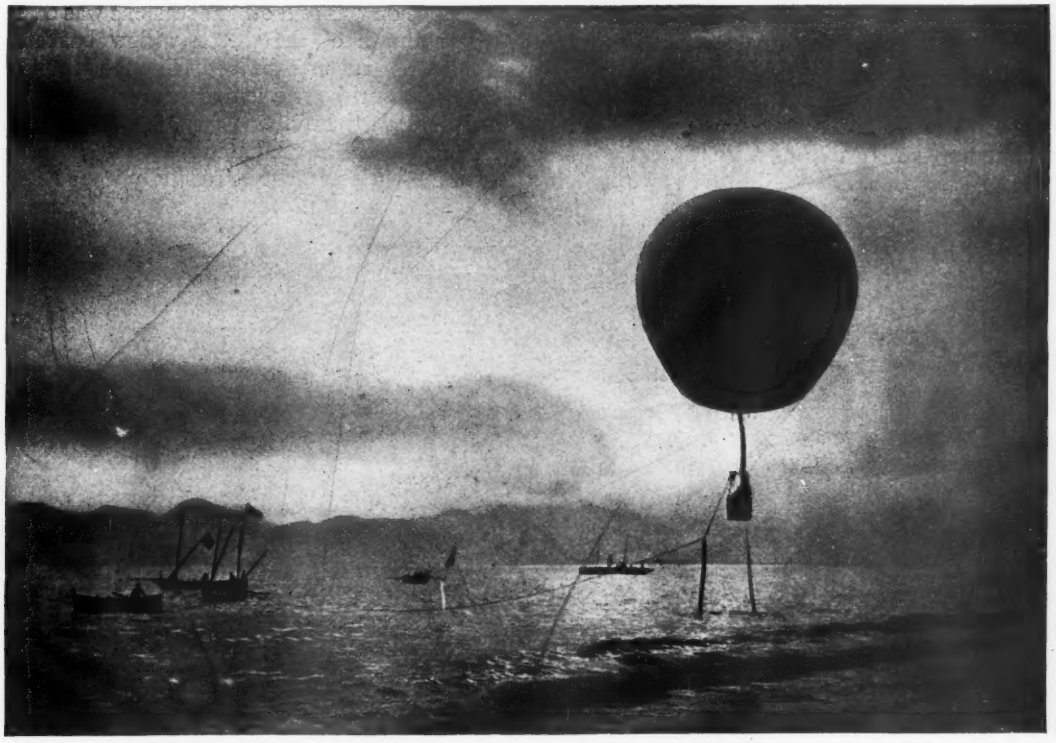
My balloon is 60 feet high, 47 feet in greatest diameter, and holds 60,000 cubic feet of gas. The gas bag is covered by a net which comes down to a concentrating ring to which the basket is attached. In an emergency I could climb into the rigging and detach anchor, basket, and ballast to lighten ship; but though I have made many ascents I have met but one emergency that required it. Like all modern balloons, mine has a valve in the top, the cord of which leads down inside the bag, coming out through the bottom, which is left open to provide against bursting when the gas expands in the sunshine. There is also a device for ripping the bag by a powerful jerk on a cord. This once saved my life. I was making a long trip in an effort to break a record, sailing along at thirty-five miles an hour near Brant Rock, Massachusetts, when it became plain that the balloon was blowing out to sea. We threw out the anchor. It caught for a few seconds, and then with a frightful jerk pulled loose. It leaped over the ground, catching, tearing up



A SEA OF CLOUDS

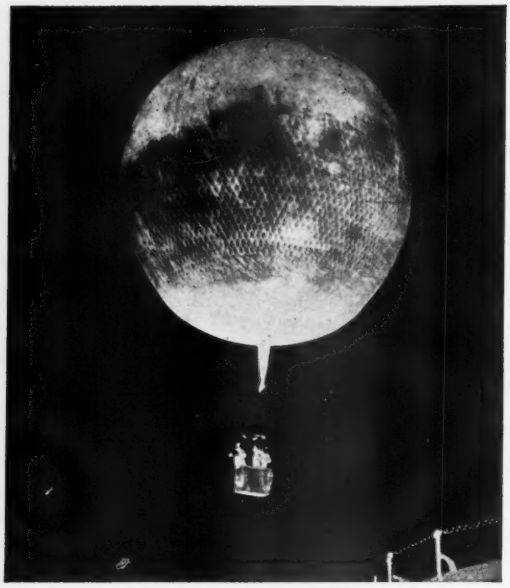
Over which Dr. Thomas was passing when the photograph was taken

the earth, and pulling loose again time after time, while the balloon jumped wildly and threw the basket hither and thither. At one time, turning completely over, it threw my companion, Mr. Knabenshue, and me into the rigging. Another toss and we were back in the basket. At last when we had blown within 150 yards of the ocean, I gave the rip-cord a powerful jerk, the gas escaped from the bag, and we instantly dropped like a plummet. But though



A DESCENT AT A PERILOUS MOMENT

When the balloon was in danger of drifting out to sea with a change of wind



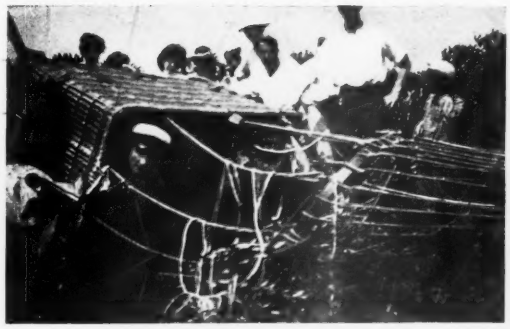
OFF FOR A MOONLIGHT TRIP

we fell into a ditch with the overturned basket on top, we crawled out unhurt.

For an ascension the big bag is filled with coal gas, for though this gas has only half the lifting power of hydrogen, it is considerably cheaper. I usually take up two or three passengers and 1,000 pounds of sand in bags for ballast. A little ballast is thrown out to cause the balloon to rise, and a little gas is let out to make it sink. The gas—indeed any gas—is very sensitive to changes in temperature: the heat of the sun causes it to expand, dilating the bag; and cold, clouds, or rain cause it to contract and lose part of its lifting power. On one occasion, rising suddenly through a stratum of clouds 10,000 feet high in the air into brilliant sunshine, the gas dilated. I let out a little. Down we dropped into a cold air current. The immediate condensation of the gas dropped us back into the cloud layer, which condensed the gas still more and accelerated the drop. We came out directly above a stretch of woods over which lay another cool belt. By this time we were falling like a rock. We were going so fast that the bagfuls of sand we threw out went up instead of down. Hastily we threw out the drag-rope, the anchor, the lunch basket—to little purpose. We struck the trees with a terrific crash, but escaped, however, with nothing worse than a shaking-up and a few bruises. When we attempted to ascend again, it was impossible for the balloon to rise till my brother, who was the other passenger, had got out of the basket, taking with him much of my apparel and all of our scientific instruments. We had really needed 200 pounds more of ballast than we had to stop the downward rush. Our escape on this and other occasions was due to the strength of the woven willow basket; this is so constructed that if it strike the ground at fifty miles an hour one need not be injured, if one hold on tightly.

As the bag is being inflated for a start, every part of the balloon must be carefully inspected. Once when some professionals had prepared

HOW THE COUNTRY LOOKS FROM A BALLOON IN PASSING



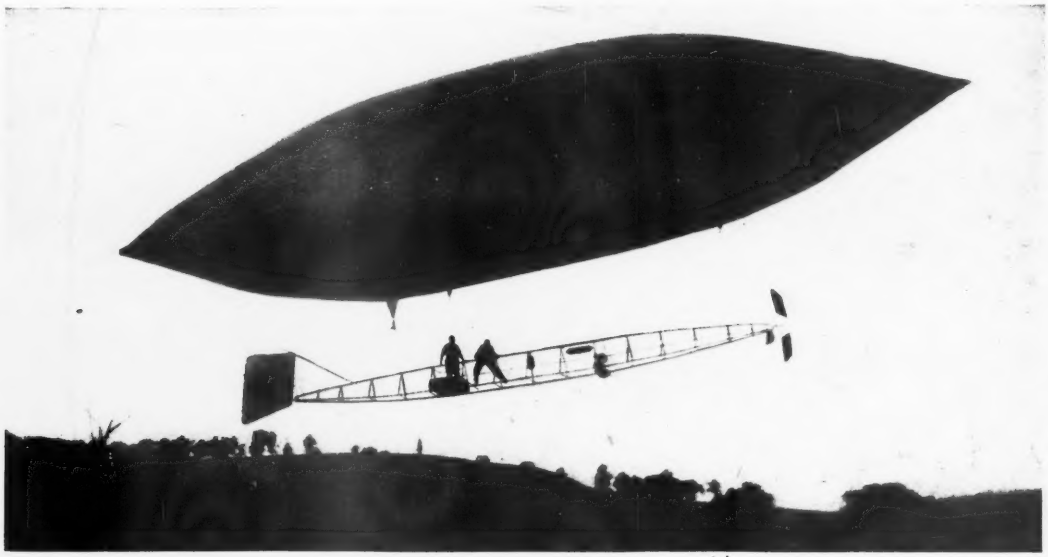
A SHIPWRECK ON LAND
Dr. Thomas crawling unhurt from the basket after landing at high speed

the balloon for a flight, I found, just as we were about to start, that the rip-cord had been fastened so that it would have failed to work if I had tried to use it. After that I never allowed a professional near but superintended the operations myself.

I usually have the balloon inflated at a gas works near my house in New York and close to the banks of the Hudson River. When all is ready, the men who are holding the balloon let go, and in an instant the earth has dropped far below. There is no sense of going upward —the impression is that the earth instantaneously drops. Even when soaring there is frequently no sense of motion. Of course one never feels any wind, since the balloon answers to any wind that blows. The earth seems simply to be sliding away beneath one. The

DR. JULIAN P. THOMAS, HIS WIFE AND SON
About to start on a flight

sensation is one of great exhilaration. One can see for miles and miles in every direction. I remember once counting from a point above

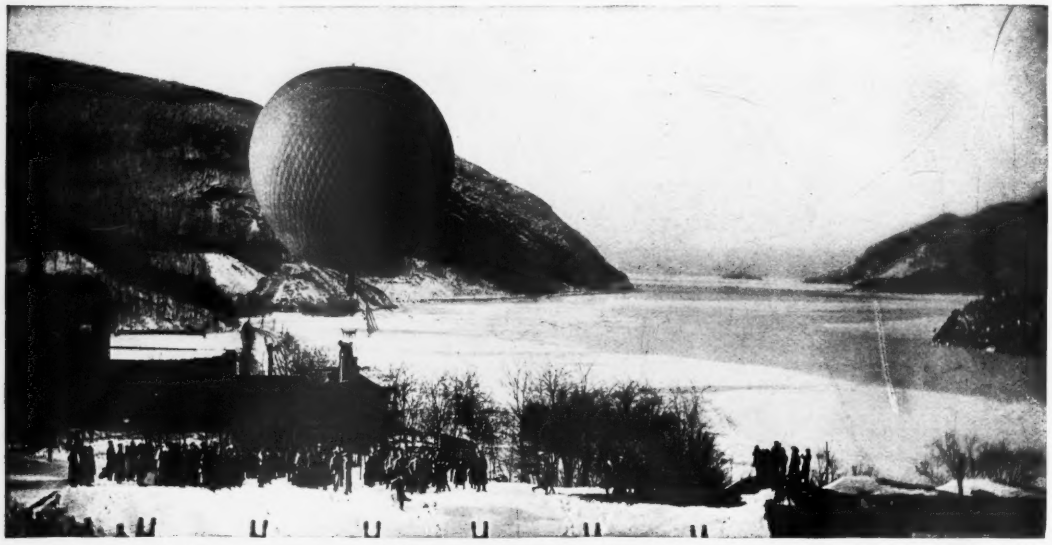


DR. THOMAS TRYING HIS NEW AIRSHIP

A HOT-AIR BALLOON COLLAPSING

New York six race tracks, far apart on different sides of the city. After the first dropping away of the earth and the sudden subsidence of the shouts of people watching the ascent, silence and apparent motionlessness supervene. Looking over the edge of the basket, one sees the houses far below, looking surprisingly small and hard to identify. The only strange sensation is in the ears. Curiously, I have found that the sensitiveness of my ears to varying air pressures has developed practically a new sense. I can now tell by the feeling in my ears approximately how high we are—a faculty that is of peculiar value in fog or clouds. Once when the statoscope got out of order in an electric storm, we were drifting along in a cloud when my ears told me that we were rapidly descending. My companion doubted it, but I at once began throwing out ballast. Suddenly we emerged from the cloud to find ourselves just about to dash against a mountain. It took quick action to save ourselves from being dashed to pieces.

The sport of ballooning is trying on the nerves, but in spite of the excitement I tend to become sleepy. On one flight, I was sure that we were blowing out to sea. It was a moonlight trip with Mr. Knabenshue on which we had intended to go west; finding the wind southeast, we were unwilling to come down, though wind from this quarter is always dreaded by aeronauts starting from New York. It was bright moonlight and we could see everything plainly. As we drifted toward the Connecticut shore of Long Island Sound, people shouted to us, begging us to descend. Friends in automobiles followed as well as they could, and when we blew out over the



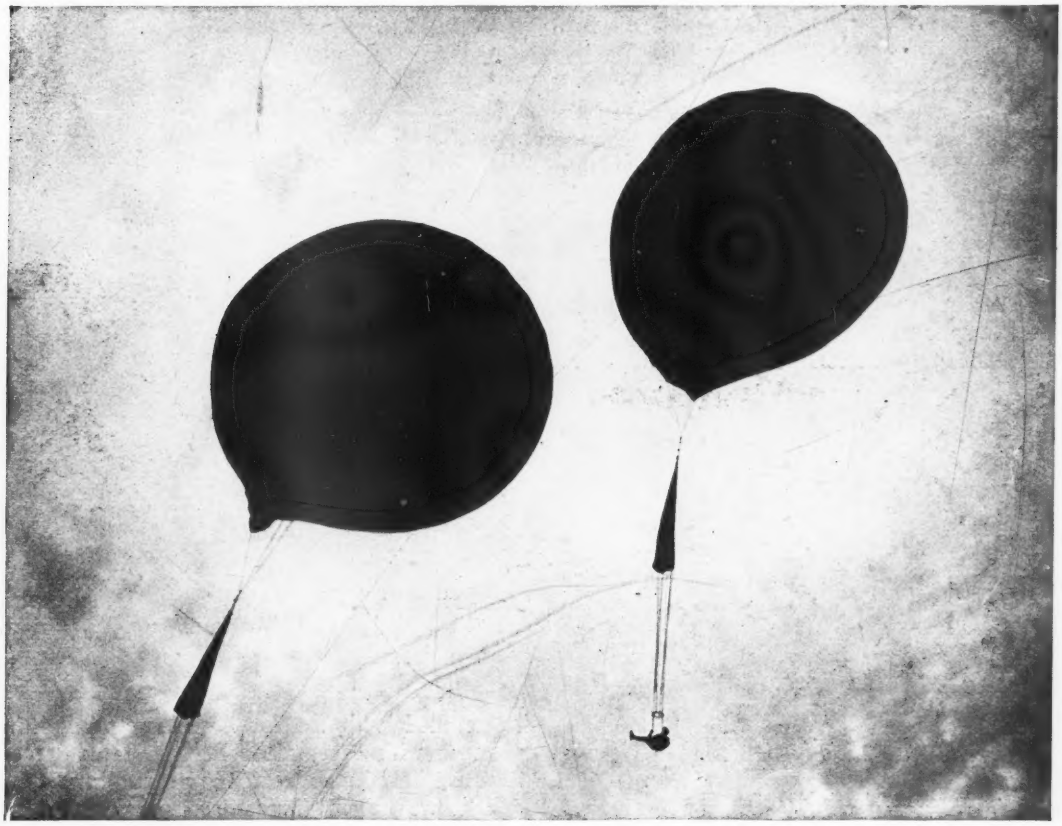
COUNT DE LA VAULX, THE FRENCH AMATEUR AERONAUT, STARTING ON A FLIGHT FROM WEST POINT

During a visit to the United States to encourage the sport of ballooning

Sound, boats followed our course, the owners fearing for our lives. Soon we were lost in a dense fog. At first the lighthouses were a comfort, but presently they disappeared. We moved on, hearing now and then the dismal hooting of foghorns, but not knowing whether we were ten feet or a hundred yards above the water. Yet we slept in turn as soundly as ever on *terra firma*.

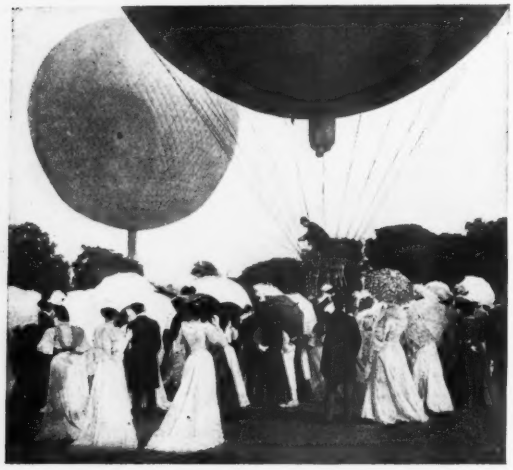
This was the longest trip I have ever taken. When morning broke, we were still enveloped in the fog. We did not know whether we were above the land or above the water. Suddenly we heard a cow bellow. Instantly I pulled the valve cord, and down we dropped on a long peninsula that thrust out athwart our course up the Sound. We safely anchored in the top of a tree and shouted. A farmer came out of a near-by house, and after his amazement had subsided, told us where we were and gave us our breakfast. As the wind had now shifted to the southwest, we set off again. After sailing for several hours, we came down near Brant Rock, not far from Boston, in the manner already described. To make successful voyages, one must have not only a fine balloon and plenty of ballast but expertness in handling the balloon and in judging from the information given by scientific instruments what is the best thing to do at any juncture. There are many air currents constantly moving in different directions, and it takes some judgment to know whether to go up or to go down to find one favorable. If the right one can be found, an aeronaut can go in any direction he pleases.

The proximity of the sea made it incumbent on me to experiment with sea-anchors, or drags. Both those in use here and in France proved unsatisfactory. A party of New York aeronauts, for example, who did not understand the workings of the French sea-anchor—a great canvas bag that holds 200 gallons of water when open—threw it overboard one day last



HOW THE ACROBATS AT COUNTRY FAIRS SAIL ALOFT IN HOT-AIR BALLOONS, TO DROP WITH PARACHUTES

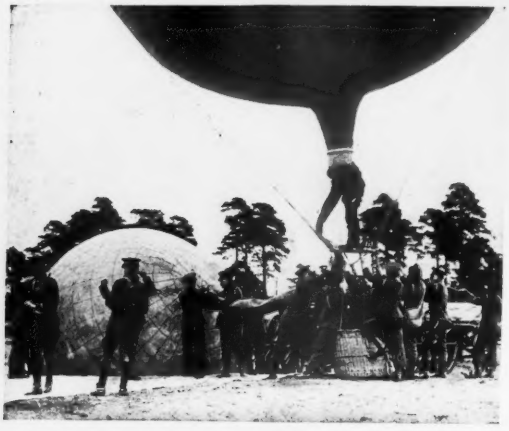
The man in the picture is about to cut loose



THE START OF A BALLOON RACE FROM LONDON
"Ballooning has the social atmosphere of automobiling or yachting"

summer when the wind was blowing them swiftly along the East River. It stopped the forward progress, but the wind was blowing so strongly that it blew the balloon down into the water. The basket was submerged and the passengers were entangled in the netting. Only the timely arrival of boats saved them from disaster. To guard against such accidents, I have invented a sea-anchor which can be adjusted to pull with varying force. Like the others, it is a cone-shaped bag to be let down into the water with the wide mouth pointing in the direction of advance. But I have cut in the side of the bag a hole as large as the mouth, and fitted a flap to it. As the anchor drags it offers no resistance till, with the jerk of a cord, I close the opening. By opening and closing this hole I can regulate the drag. I never make an ascension now without one of these anchors.

In addition, the balloon is equipped with a guide rope, 300 feet long and weighing seventy-five pounds, which hangs down and trails on the ground or the water when the balloon is low. Such an adjunct is considered useful, but I have found it of no value except for indicating direction at night. I have also



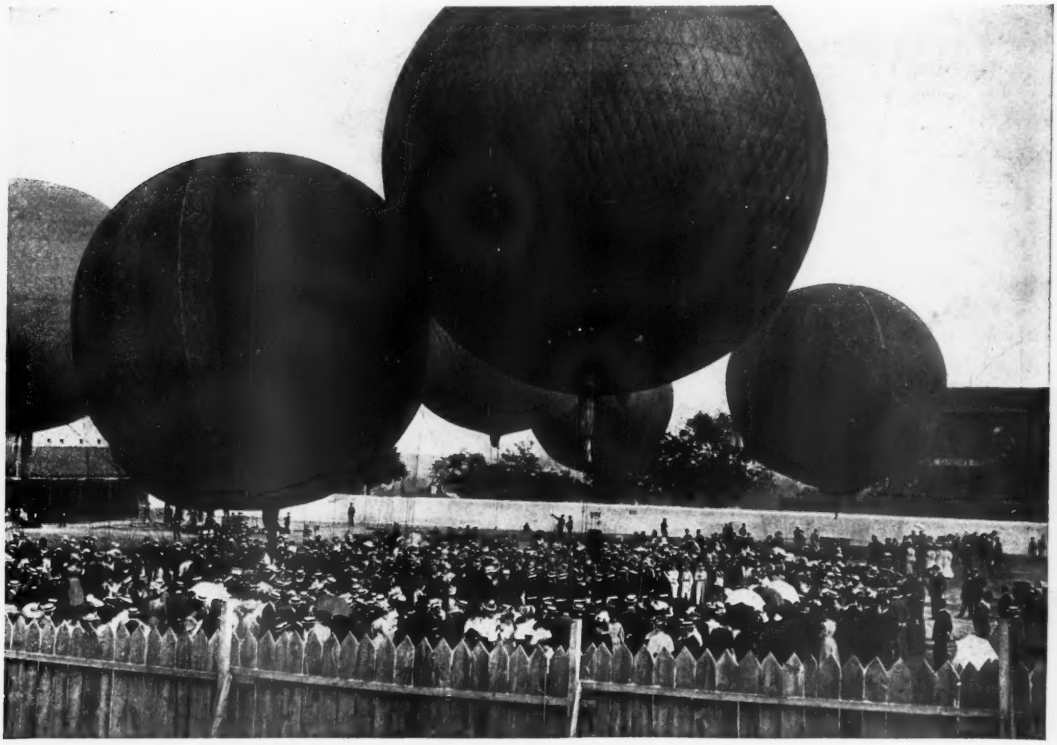
FILLING ONE BALLOON FROM ANOTHER
At the military manœuvres at Aldershot, England, at which the King was present

LIEUTENANT LAHM (holding the letter), THE AMERICAN WHO WON THE RECENT INTERNATIONAL BALLOON RACE FROM PARIS, JUST BEFORE THE START
Major H. B. Hersey, whose meteorological knowledge was of great help, at his side

installed a device for lowering and hoisting ropes with ease, made necessary by the enthusiasm of people on the ground who think that the proper thing is to seize any rope dangling from a balloon. Once, in Brooklyn, some eager persons seized the guide rope and, despite my shouts, wrapped it quickly about a

post. The balloon, which was carrying my wife as well as myself, at once blew down at twenty miles an hour and lodged in a cherry tree with an impact that shook us up severely and sprained my wife's ankle. Looking up, we were cheered by a large bronze cross and the kind faces of Sisters at the windows of a convent in the yard of which the cherry tree stood. Not content with the damage they had already wrought, the crowd kept pulling on the rope till they brought the basket down on their heads. In the excitement, three horses ran away. It took several policemen to quell the exuberance of the crowd and free us. Unable to do anything, I climbed to the rigging and took pictures till we had risen 4,000 feet. On another occasion, a crowd caught the drag rope and pulled the balloon directly over four smokestacks belching black clouds shot with sparks. I have never understood why the balloon did not explode before the police induced the crowd to release the rope, at the suggestion of a friend in an automobile who realized our danger.

The most exciting trip I ever made was a record-breaking voyage that began one Sunday evening. The weather was not propitious, but not caring to disappoint the thousands of people who had gathered to see the ascension, we cast off. We sailed across the Hudson River to New Jersey, and plunged into a cloud. After traveling twenty miles, I descended to drop a note to my wife, assuring her of our safety. Again we shot into a cloud. Presently we drifted over a village and, with that exaltation that accompanies the sensation of floating in the air, enjoyed to a strange degree the music of church bells drifting up from below. Lost in reverent thoughts we drifted, before we were aware, straight into the bulging front of a hugh approaching thundercloud. It seemed to open and swallow us into a pit of gloom, and simultaneously into the heart of the wildest thunderstorm I think I have ever seen. The clouds rolled and tossed and twisted. The balloon would now be forced down, then tossed up, and again spun swiftly about like a top. We lost all sense of direction. Thunder was crashing and rolling and crackling all around us. Lightning flashed, not in forked zig-zags but in great flashes of fire. A sudden rift in the clouds showed us a vista of cloud floor that



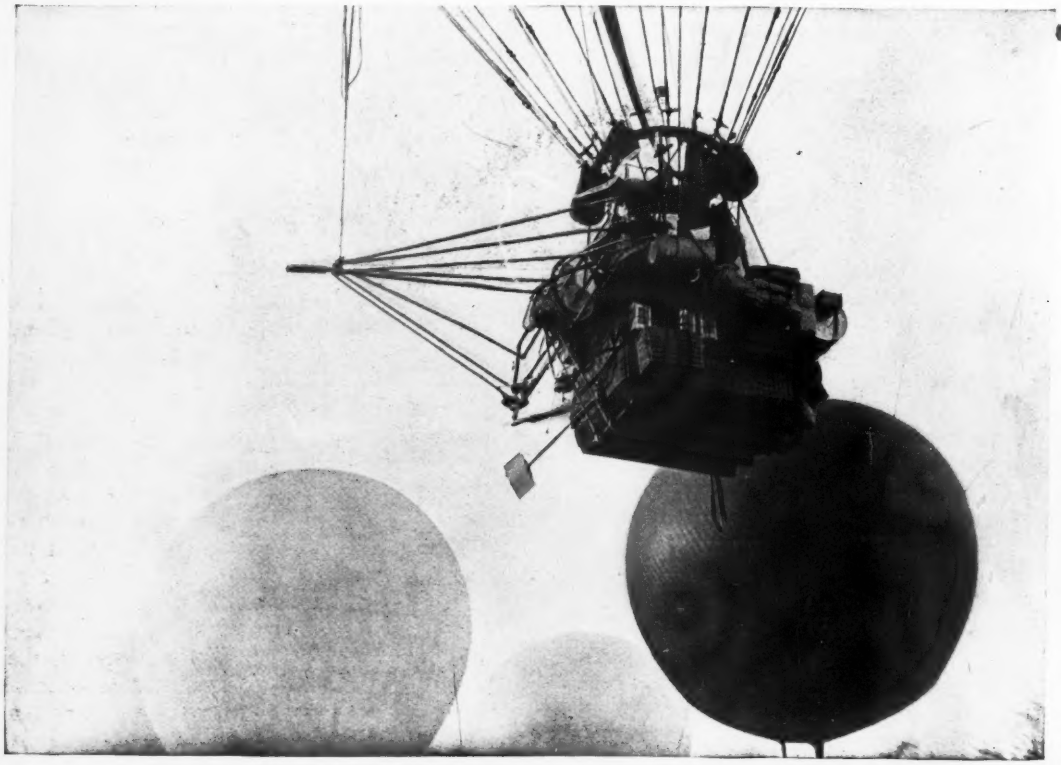
A BALLOON RACE STARTING FROM MADRID, SPAIN

looked like a flickering sea of fire extending miles and miles to an indefinite distance. All below seemed a fiery abyss. It was a sight of stupendous grandeur. Then the clouds enveloped us again. A thunderclap would be followed by echo after echo that continued till the next peal came—a never-ending reverberation. It was a frightful experience and yet pleasurable. The atmosphere was so full of electricity that sparks leaped whenever a rope was touched.

All night we traveled, blowing onward with the storm, drenched in an extraordinary downpour. All the water that struck the gas bag, of course followed its curve and poured down into the basket. Presently the wind began to blow forty miles an hour in the opposite direction. Back we came past our starting point, and forthwith began to fear blowing out to sea. We did not want to descend, but presently we heard the unmistakable sound of water not far away. Letting out a little gas, we shot downward. Faster we dropped, and faster. Land was below us. The problem was to land in the high wind without damage—something like stopping an express train suddenly and derailing it at the same instant from a trestle in the dark. I let out more gas. We landed in a tree-top with a jar that fixed the basket so firmly in a crotch that it could not be dislodged by the wind, for now we had dropped below the storm.

We tied the balloon and, drenched as we were, remained in the basket the rest of the night. Early in the morning we were awakened by the storm, which had now descended into the valley. It gave the balloon a twist and, tearing off the top of the tree, whirled us onward again. After a voyage of twenty-five miles more, we made a safe landing in a meadow.

Ballooning is the sport of sports. There is no other form of exploring that a man can start on from his city home and reach a mysterious world of new sensations and novel experiences in three minutes after he has left his starting point. I expect to see a development of the sport in the United States that shall equal that in France. And every balloonist moves forward the day when the problem of man's flight shall he solved.

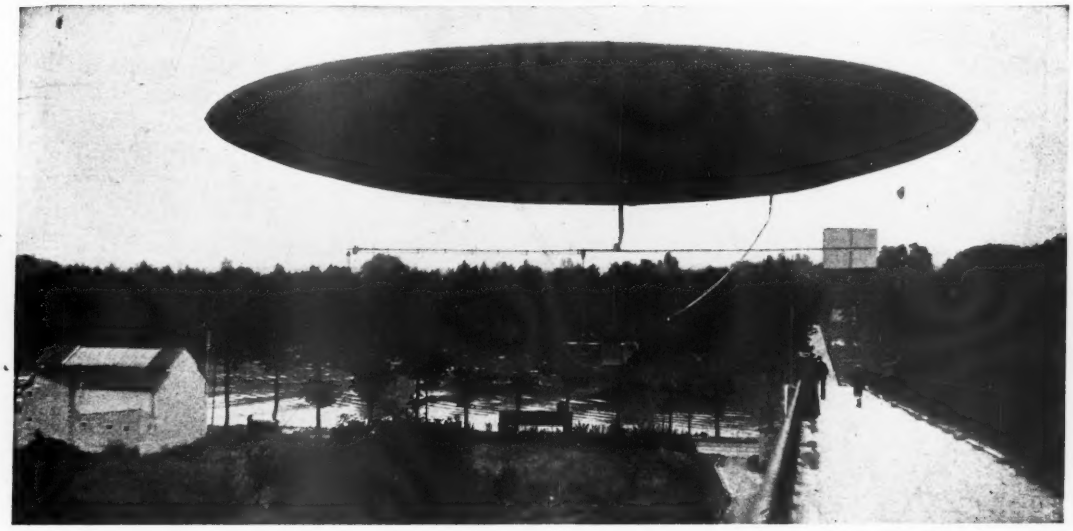


THE CAR OF SANTOS-DUMONT'S BALLOON IN THE INTERNATIONAL RACE

Showing the mechanism with which the aeronaut hoped to direct his course and the elaborate equipment taken along

COUNT DE LA VAULX, WHO HOLDS THE LONG DISTANCE BALLOONING RECORD, NAVIGATING IN AN AIRSHIP THAT HAS REMAINED ALOFT EIGHT HOURS AT A STRETCH

Note how his car differs from the type developed by Santos-Dumont and his imitators



THE CONQUEST OF THE AIR

THE STORY OF MAN'S EFFORTS TO FLY—BALLOONING A THRILLING SPORT BUT NO NEARER FLIGHT THAN IT WAS 100 YEARS AGO—WHAT THE AERONAUTS ARE DOING WITH THE DIRIGIBLE AIRSHIP—AEROPLANE EXPERIMENTERS ON THE VERGE OF SUCCESS AFTER FASCINATING EXPERIENCES

BY

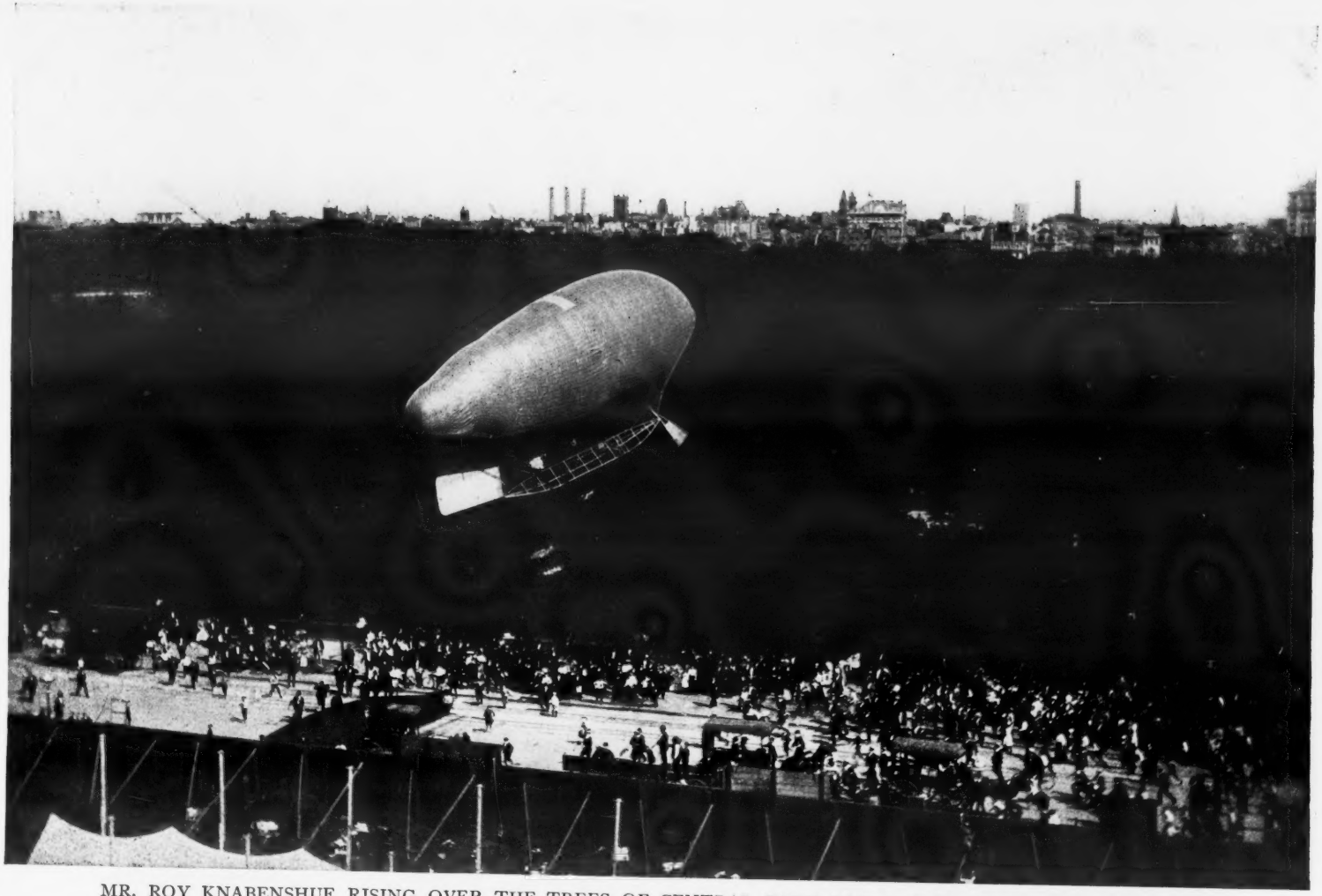
BERNARD MEIKLEJOHN

WE OF THIS generation shall see man fly. It is even probable that, equipped with the results of Langley and Maxim and taught by their own experiments, two citizens of Dayton, Ohio, are flying in secret to-day. Within five years, through Santos-Dumont's attaching a gasoline engine to a spindle-shaped balloon, we have got the dirigible airship. Yet this advance is to satisfactory flight what the first paddling of a floating log was to the iron steamship. Not to a dirigible gas-bag lighter than the air but to some kind of aeroplane—a machine heavier than the air and kept afloat by the air resistance its motion sets up on the under side of wings—must man look for his aerial craft. Santos-Dumont is at work on one now, and a hundred other enthusiasts in Europe and America. M. Deutsch, whose offer of a prize for a successful airship so stimulated Santos-Dumont, has offered another for a successful flying machine heavier than the air. Its winning is probably not remote.

But the balloon story first!

FROM BALLOON TO AIRSHIP

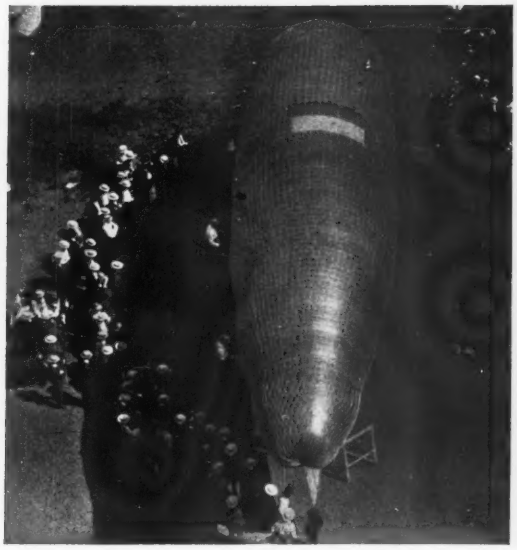
Not long ago, on a calm and sunshiny afternoon, the people of New York saw high overhead a small dark dot with what looked like a fluttering snow-white pigeon just below it in front and a bit of gleaming card-board behind, and between was an agile speck that moved about uneasily. Rapidly coming nearer, the wonder proved to be a cigar-shaped balloon with a long narrow frame beneath, bestridden by a man who was steadily steering his way through the zephyrs. The white fluttering thing in front was a revolving propeller kept



MR. ROY KNABENSHUE RISING OVER THE TREES OF CENTRAL PARK FOR A TRIP ABOVE NEW YORK CITY

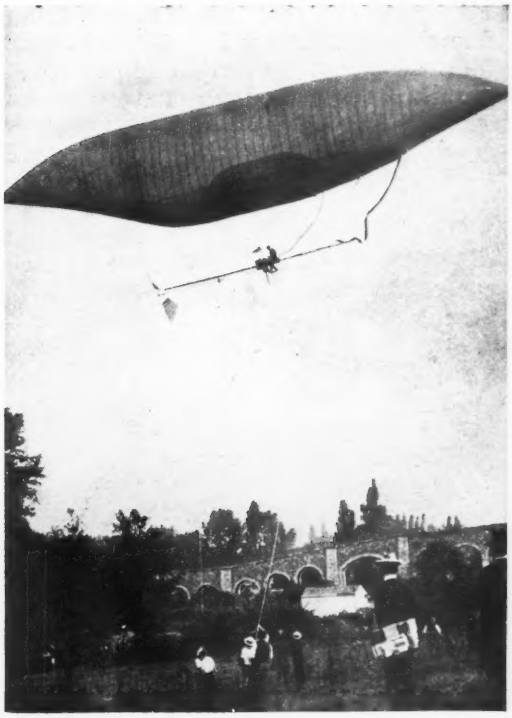
The airship returned and landed gently in the same spot

MR. ROY KNABENSHUE IN A FLIGHT OVER NEW YORK CITY

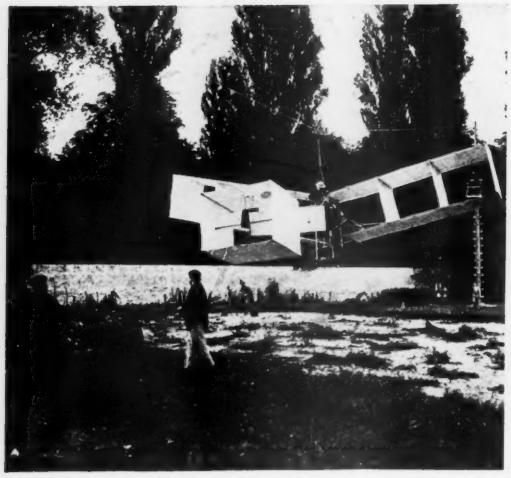


THE BAG OF MR. KNABENSHUE'S AIRSHIP, SEEN FROM ABOVE

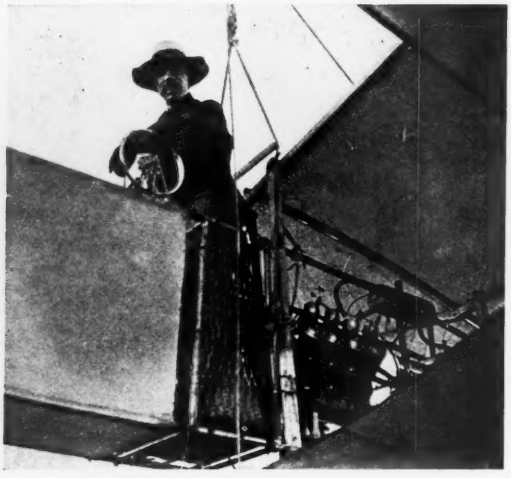
going by a gasoline engine, and the third thing behind was a rudder. It was Mr. Roy Knabenshue in his dirigible airship. Washington,



AN ADVANCED TYPE OF AIRSHIP IN WHICH THE FRAMEWORK HAS BEEN SIMPLIFIED



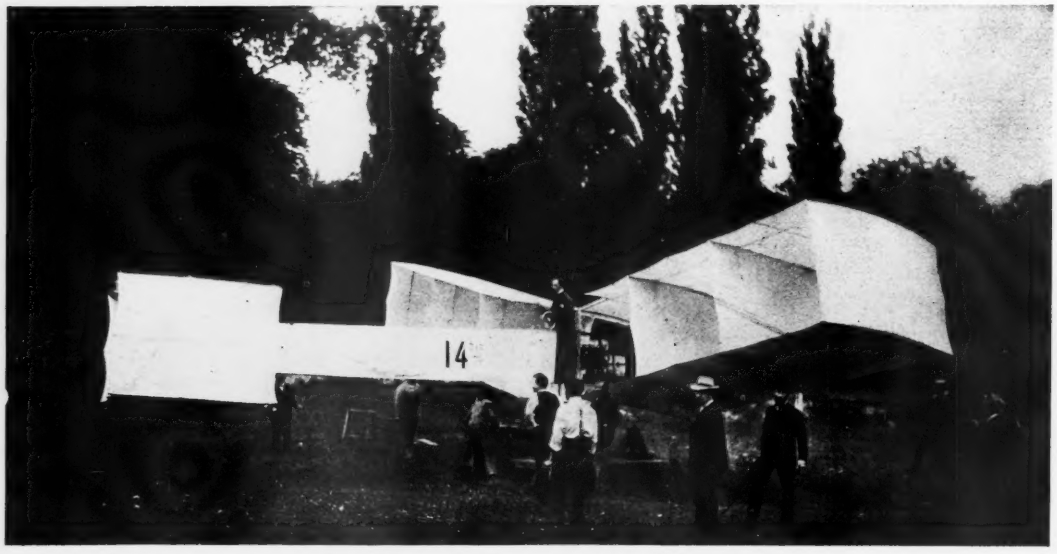
A FRONT VIEW OF SANTOS-DUMONT'S "BIRD OF PREY" ON A VERY EASY TRIAL



SANTOS-DUMONT ON THE BASKET OF THE "BIRD OF PREY," HIS AEROPLANE

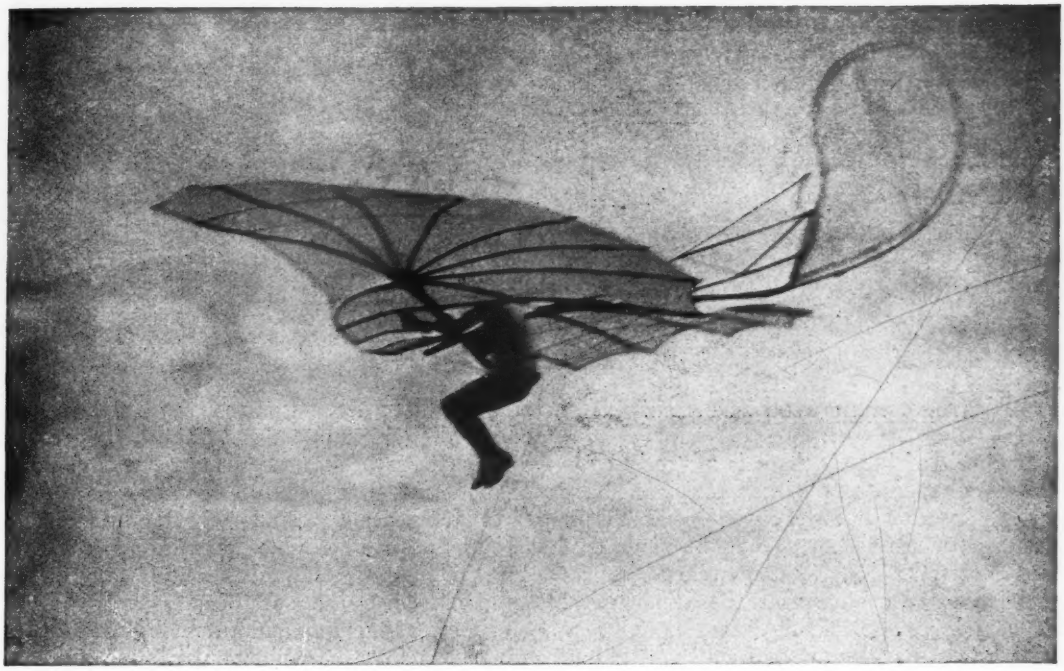
St. Louis, and other cities have seen this, or other such airships, and they are a common sight in Paris. Santos-Dumont has a little "runabout" airship, a long "racer," and an "omnibus" in which he makes frequent trips. The success that he and others have had has convinced Mr. Walter Wellman that a dirigible airship is the craft in which the Pole can be reached. So he has built a huge machine with a gas-bag of unusual lifting power, and with this, flying but a few feet above the ice-hummocks of the Arctic floes, he expects to find the Pole. These machines are the culmination up to date of the first hot-air balloon that Joseph Montgolfier sent up from above a heap of burning straw at Marseilles in 1783, after he had seen his wife's petticoat sail to the ceiling one day when left to dry by the fire.

The excitement that followed Montgolfier's first ascension resulted in others, in which, presently, the fire that furnished the hot air was built, not on the ground, but on a platform beneath the bag of the balloon. Balloons could now stay up as long as the fire was fed.



THE "BIRD OF PREY" READY TO SOAR

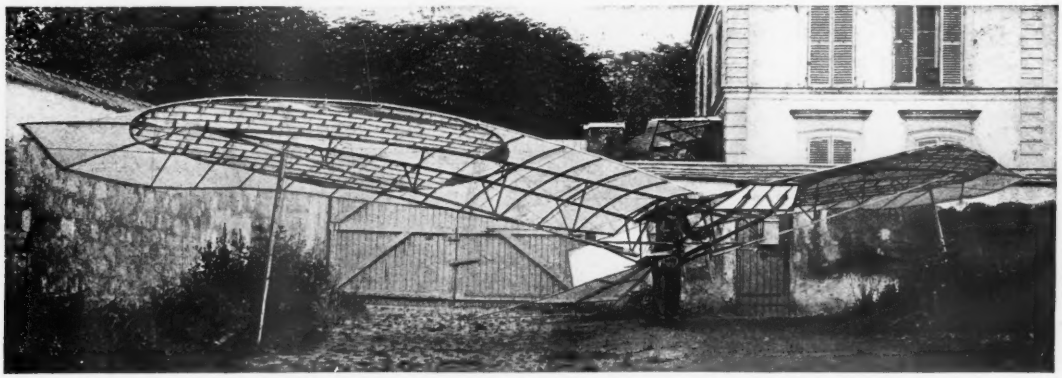
Santos-Dumont about to try a flight. This machine follows the ideas of the Wright brothers. Note that the wings are curved and that a huge front box aeroplane is used instead of a tail



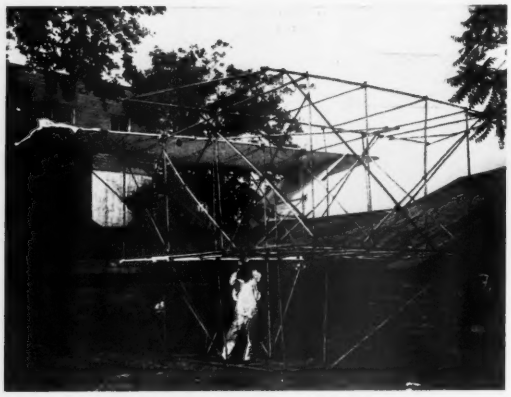
OTTO LILIENTHAL, THE FIRST MAN TO USE WINGS WITH ANY SUCCESS, MAKING A GLIDE

Chemists soon pointed out that hydrogen was far better than heated air, since it maintained, instead of gradually losing, its buoyancy. Ordinary ballooning forthwith, more than a century ago, became practically what it is to-day. Glaisher in England once ascended so high as to become asphyxiated, and in 1875 Tissandier, the French aeronaut, went up with two other men into the deadly chill of the thin atmosphere nearly six miles above the earth, and only he came down alive. Aeronauts afterward contented themselves with lower levels, though the highest ascension ever made was that of a German scientist, three years ago, a thousand feet higher than Tissandier's. Long distance flights have carried balloonists many times across the English Channel, balloons have drifted from Paris to Norway, and now Dr. Julian P. Thomas thinks little of ballooning from New York to Boston. The longest trip ever taken was one which Count de la Vaulx made in a race but a short time ago from Paris to a point in Russia nearly 1,200 miles away.

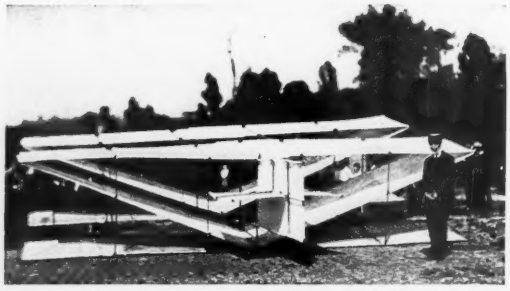
But ordinary balloons are still at the mercy of any breeze that blows. Balloonists now use guide ropes, but practically no other appurtenances that they did not have fifty years ago. It has been seriously suggested that in one of the



A FRENCH AEROPLANE THAT IS A CLOSE IMITATION OF A BIRD'S EQUIPMENT FOR FLIGHT



BUILDING THE LUDLOW AEROPLANE

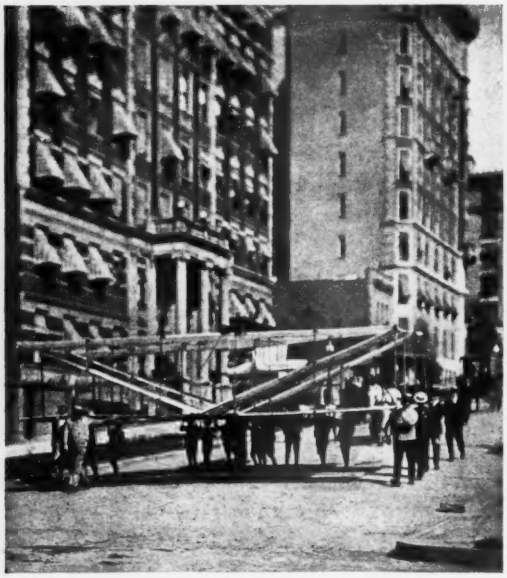


THE LUDLOW AEROPLANE JUST BEFORE ITS FIRST FLIGHT

The machine combines the tetrahedral kite with the box kite

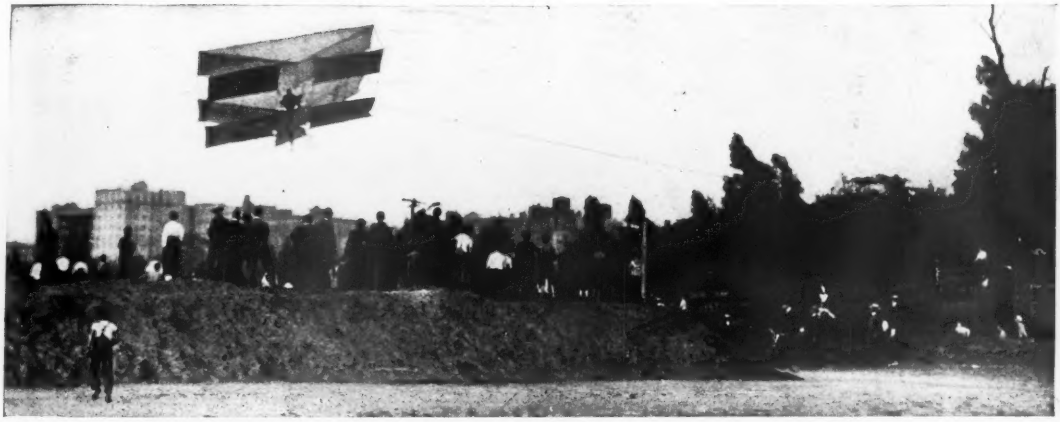
upper levels of the air there is a steady eastward current, and a balloon voyage from New York to London would be possible if only a covering for the gas-bag could be made that would not leak. But what man in his senses would take the chance that the wind would not change? The recent international race starting from Paris—won by Lieutenant Lahm, an American—was brought to an end, not because the balloons would not fly longer than the 300 miles or so that the leading ones covered, but because, having blown across the English Channel and over England, they were in imminent danger of blowing out to sea.

Ballooning, however, still remains a sport of amateurs. It far surpasses the fascination of speeding in a motor-car. From the Parc d'Aerostation in Paris, you may see a dozen balloons rising and sailing down wind on almost any pleasant afternoon, bearing members of the Paris Aero Club. Races are arranged, experiments are tried, ladies take little trips—ballooning has the social and sporting atmosphere of yachting and automobiling. The sport has not yet become popular in the United States, though Dr. Julian P. Thomas of New York vies with Parisians in his feats and hopes that many others will take up ballooning when its pleasures and excitements are better known. With expertness, it is not so dangerous as it seems; the death not long ago of Paul Nocquet, the sculptor and amateur aeronaut, occurred



CARRYING THE LUDLOW AEROPLANE TO THE BANK OF THE HUDSON RIVER FOR ITS FIRST TRIAL

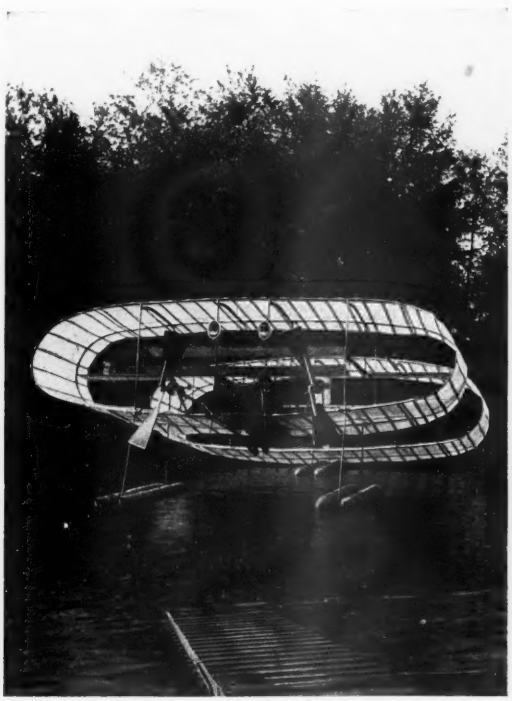
THE LUDLOW AEROPLANE WHILE IT WAS BEING ATTACHED BY A LONG ROPE TO AN AUTOMOBILE



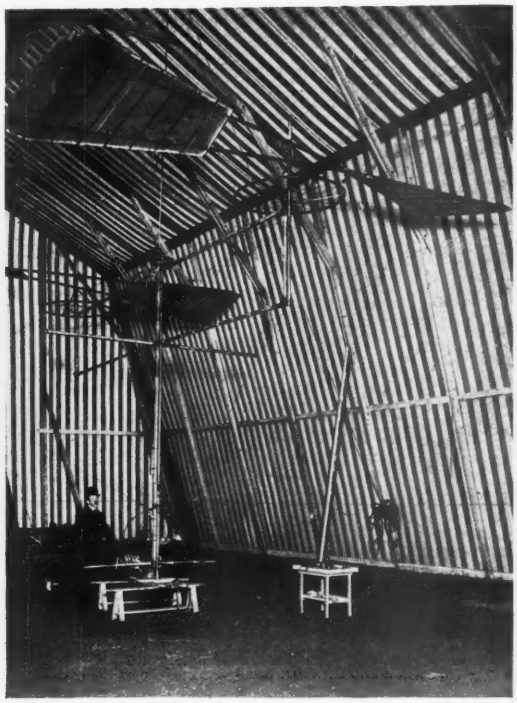
AN UNSUCCESSFUL FLIGHT OF THE LUDLOW AEROPLANE DRAWN BY AN AUTOMOBILE
It dived from a height of one hundred feet but the aeronaut escaped unhurt

not through any accident to his balloon, but through his becoming lost in a marsh at night after the balloon had safely landed. Its advantage is that it gives more thrills than any sport on *terra firma*, with less cost than any other form of aeronautics.

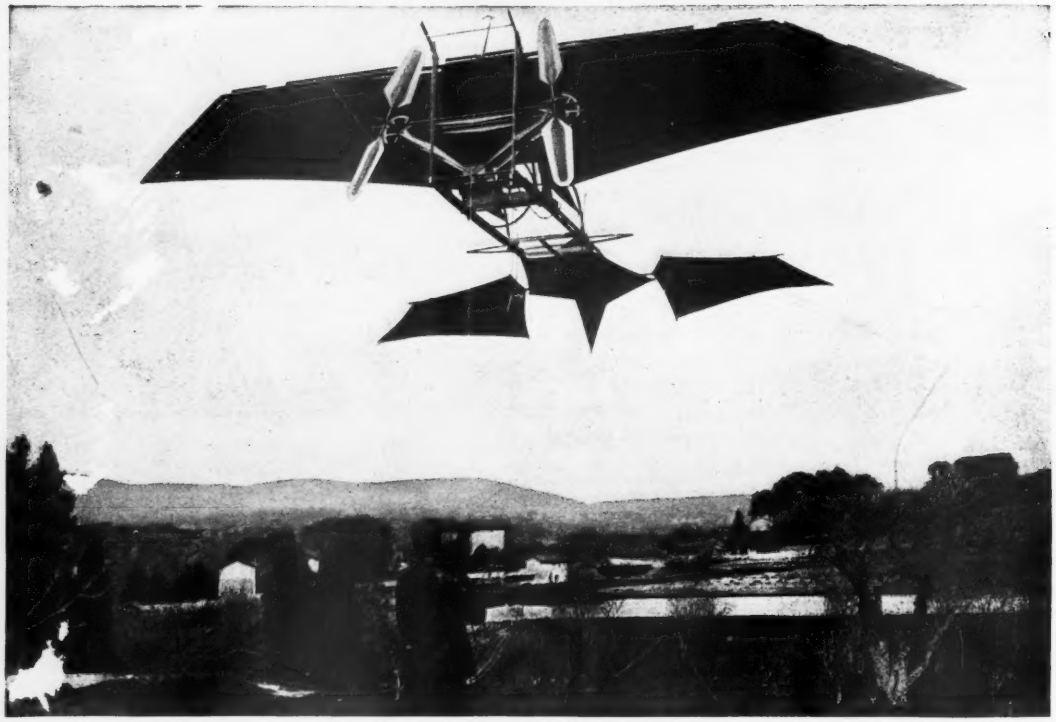
But dirigibility—or "steerableness"—has been the dream of aeronauts ever since Montgolfier's first ascension. Dirigibility, however, requires locomotion to provide the steerage way and stem the winds. One man tried in vain to get it with oars. Henri Gifford in the 'fifties tried it with a steam-engine, but speedily found that an engine powerful enough



AN ODD AEROPLANE CANNILY COMBINED WITH FLOATS
An aeroplane with life-preservers. If it doesn't fly, it can at least swim

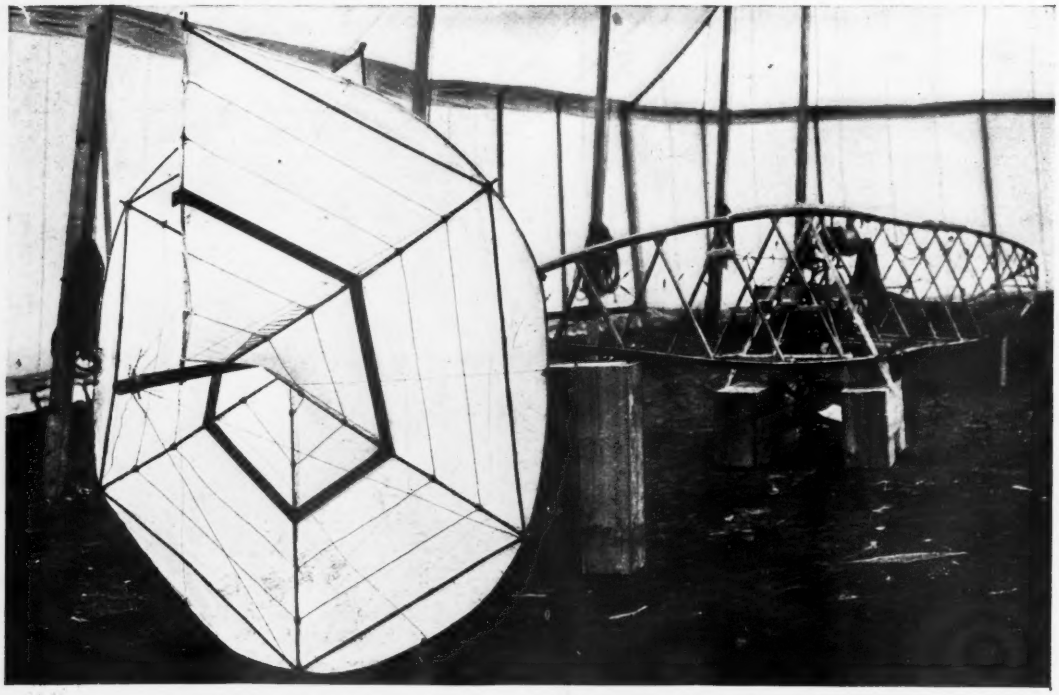


SANTOS-DUMONT INSPECTING HIS NEW HELICOPTERE
The very light motor is expected to revolve the fans rapidly enough to lift the completed machine straight into the air and keep it suspended



A BAT-LIKE AEROPLANE

It is flown like a kite by its designer at Marseilles but does not have provisions for stability



A NOVEL PROPELLER ON DR. JULIAN THOMAS'S NEW AIRSHIP

to propel his balloon satisfactorily was too heavy for the balloon to lift. Tissandier, in the early 'eighties, with an electric motor and a spindle-shaped balloon, managed to make progress against a wind of seven miles an hour, but this was the best he could do. Two French officers, Krebs and Rénard, followed with a lighter electric motor, putting their propeller in front instead of astern—a practice that has been followed since. They made fourteen miles in a calm and were able to return to their starting point five times out of seven; but the engine was too weak to control the machine on a windy day. To Count Zeppelin, of the German army, came a solution of the difficulty; to Alberto Santos-Dumont came another. Experiments had proved that as the weight of an engine increases with its power, the more powerful the engine the larger must be the balloon designed to lift it, and the larger the balloon the greater becomes the resistance of the air to its progress. But it was also found that the lifting power increases faster than the air resistance. Count Zeppelin accordingly proceeded to build a gigantic spindle by putting a cigar-shaped covering over a row of seventeen ordinary balloons, resulting in a craft as bulky as an ocean liner. It was begun in 1897, and since has made two lumbering swims above Lake Constance. It can lift engines of considerable power, but imagine handling a balloon of such size in a side-wind of any power! Santos-Dumont, on the other hand, said: "Let us not have bigger balloons: let us have lighter engines."

CREATING THE DIRIGIBLE AIRSHIP

A wealthy young Brazilian, he had amused himself by flying about Paris in a balloon so small that when it descended he would fold it up and carry it home in a valise. He was also an enthusiastic automobilist. One day while admiring the lightness and simplicity of the gasoline engine on his motor tricycle, he suddenly thought: "Here is an engine that is light enough for a balloon to carry and strong enough to drive it." He studied and worked on the engine till he was able to have one built that gave 3-½ horse-power and weighed only sixty-six pounds. Experimenting with different kinds of frames to carry aeronaut and motor, he settled on a skeleton arrangement of three pine rods hardly thicker than broomsticks, arranged in the manner shown on page 8277. Equipping the frame with a propeller in the form of revolving fans and a rudder, and with a strong willow-basket in which to stand, he attached it by cords to two wooden strips sewed lengthwise into the sides of a spindle-shaped gas-bag. And since the balloon when filled with hydrogen was calculated not to rise rapidly, but to do little more than float in the air—as all the dirigible airships since have been made—and some device was necessary to tilt its nose up and down in order to rise and to descend by the push of the propeller, he hung a heavy guide-rope at the bow. With a light line running from this to the basket, he could tilt the balloon up by pulling this hanging rope back—thus changing the centre of gravity of the machine—or down by letting it swing forward. The propeller would push the machine in whatever direction it pointed.

The theory was sound, but he built and tried four airships, meeting with dangerous falls on several occasions through the crumpling of his gas-bag, before he secured one that was really successful. This was the *Santos-Dumont V*. It had a better engine than its predecessors, was held together by piano-wire instead of cord, had the basket and the guide-rope in front and the propeller and the rudder astern, and was stiffened by a bamboo rod running keel-like along the under side of the gas-bag.

On July 12, 1901, after a run from the park of the Aero Club, the huge yellow airship rose from the Longchamp race-course above the heads of an enthusiastic crowd and encircled the track amid the noise of its crashing motor. It descended, rose again for a short flight, came back, and then started off for the Eiffel Tower three miles away. Rounding the tower, it returned. After two unsuccessful attempts to win the Deutsch prize of $10,000—offered for any airship that should start from the Aero Club Park, near Longchamp, and sail around the Tower and back, eight miles, in half an hour— he started a third time on August 8th, only to have the balloon crumple as the others had and drop to the roof of the Trocadero Hotel. Undismayed by an accident that nearly cost him his life, he began at once on the *Santos-Dumont VI*.

The crumpling of successive balloons taught him, and all airship operators since, an important lesson. It is imperative that the spindle-shaped gas-bag be rigid in order to hold its shape. But though a bag be inflated to the bursting point, a breath of cold air will condense

the gas till its covering is flabby and collapsible. To provide against this, a smaller balloon had been placed inside each gas bag, and pumping apparatus had been installed to inflate it with air whenever the gas contracted. This would keep the outer skin tight, for any loss of hydrogen would be made up with air in the inner balloon. To provide against bursting, an escape valve in the gas balloon was set to let gas out whenever the pressure became dangerous. But the apparatus had not worked properly. First on one airship and then on another, the air pump had stuck or the gas valve had popped off too soon. So the *Santos-Dumont VI.* had a pumping apparatus rigged in such a way that the engine would keep pumping air constantly into the air balloon up to a certain pressure. An escape valve prevented too high pressure, and it was set to go off before the gas valve should pop. The value of the provision was emphasized at this time by the death of M. Auguste Severo, who rose to a great height in a runaway airship —for imitators of Santos-Dumont had begun to make trials—and fell to his death because his gas-valve had been sealed, and in consequence the balloon had exploded. Less expert than Santos-Dumont, M. Severo had failed to mount slowly as a precaution against the rapid expansion of hydrogen in the sun. Rising quickly, the airship had kept on going up and up with horrible rapidity till it burst like a rocket.

On October 19, 1901, Santos-Dumont won the Deutsch prize by covering the prescribed course in twenty-nine minutes and thirty seconds in a wind that was blowing as hard as the maximum speed of the *Santos-Dumont I.* He had been the first man to feel the exhilarating sensation of moving both vertically and horizontally at will in vast swoops—which he describes as a most intoxicating experience—and he had fulfilled a rigid test of free movement in the air after only four years of experimenting. His increasingly powerful lightweight engines, which the automobile industry had developed for him, gave him the crucial advantage that his predecessors had lacked—power without weight. He had secured gasoline engines that weighed less than ten pounds per horse power, as compared with Tissandier's 375, for his electric motor. And since a large part of the fuel burned in such an engine is air, the few gallons of gasoline that had to be taken up were a mere bagatelle compared with heavy battery cells or coal for a steam engine.

One hundred pounds of it will drive an airship half a day. Contrary to pessimistic predictions, the danger of explosion from keeping a gasoline engine so close to a gas-bag has proved slight. Santos-Dumont had one trifling fire which he put out with his Panama hat.

WHAT THE DIRIGIBLE HAS DONE

And now, in the five years since he created the dirigible, what has it done?

Santos-Dumont, himself, after building his third craft, constructed a balloon house of his own and decided to devote his life to aeronautics. With an independent fortune, he could afford to build airship after airship, trying differently shaped gas-bags, different arrangements of the mechanism to bring all the ropes and levers for guide-rope, engine, rudder, valves, and pump, conveniently under the hand of the man in the basket, and installing more and more powerful engines as the automobile manufacturers turned them out. His racing airship, Number Eight, was pencil-like and good for thirty miles an hour. His runabout was small and egg-shaped, and good for fifteen. In this he once amused himself by sailing up a Paris boulevard between the houses, and dropping in at his own house for breakfast. The *Santos-Dumont X.*, the omnibus, was long like the racer but thick like the runabout, with a speed between the other two, and enough lifting power to carry several passengers. But by the time he had arrived at the *Santos-Dumont XIV.*, this pioneer of the lighter-than-air school of aeronautics had begun his conversion to the heavier-than-air principle, and Number Fourteen has a very small gas-bag combined with aeroplanes. He calls the aeroplane attachment, shown in the illustration, the "Bird of Prey." It is designed to rise and sail by the exertion of power alone. He hopes to be successful enough with this to discard the gas-bag altogether and win the new Deutsch prize with it. He has started on the road to a real flying-machine.

Except for aeroplane attachments like this, the dirigible remains a fixed type. Those we have seen in the United States resemble Santos-Dumont's achievements in their more advanced forms. Baldwin's *Califjornia Arrow*, which made evolutions at the World's Fair at St. Louis, was like the Parisian machines, and the

Toledo II., in which Mr. Roy Knabenshue, who sailed the *California Arrow*, has manœuvred above a number of American cities, is of similar type except that the aeronaut disdains a basket and tilts the machine by moving forward and backward on the frame. The gas-bag is slightly flattened on the bottom, thus possessing some aeroplane value. The machine can take up enough gasoline for a five-hour trip. Mr. Knabenshue does not take up ballast, and depends somewhat on his gas-valve for descending, as the French navigators do, but ties his valve with a piece of rubber that will burst if the pressure reaches the danger point. He rises by straddling the frame near the stern, thus tilting the nose of the machine upward, and starting the motor that works the propeller fans forward. To change the slant of his course to the horizontal, he simply moves forward, and he wriggles further forward still to descend. The machine moves like a great bloated fish about fifteen miles an hour. He and Dr. Thomas are now at work on an improved type, the car of which is shown in the illustrations.

None of these machines are manageable in a wind of any force. Nearly two years ago an aeronaut named Heaton was blown out and dropped into San Francisco bay. The leaking of his gas made the airship uncontrollable. The Barton airship went up a year ago last summer in England, equipped with four aeroplanes and carrying five passengers. It met a fitful wind that sometimes blew thirty miles an hour. Even in these gusts the aeronauts steered it in every direction, but having drifted fourteen miles down the wind it could not return. The builder of this, Dr. Barton, like Santos-Dumont, decided to abandon the gas-bag, and work on the aeroplanes. Count Zeppelin tried his 420-foot monster again a year ago, taking up enough fuel for a run of fifteen hours. The motors worked badly and he was obliged to descend. Count de la Vaulx, however, one of the keenest of the French enthusiasts and the holder of the long-distance ballooning record, in an airship built last summer careered about Paris one day for eight hours without descending. He also designed a new type of car, a photograph of which is presented herewith.

Because this eight-hour flight was notable, aeronauts and Arctic explorers are not sanguine that Mr. Wellman will succeed in his attempt to reach the Pole in a dirigible. He was to have started last August, but because of difficulties with his equipment has postponed the trip for another year. An Arctic explorer of considerable experience, he decided that since the chief obstacle to reaching the Pole has been the roughness of the ice to be crossed for 600 miles going and another 600 returning, the path through the air is the only practicable one. Two miles a day has at times been the maximum advance that explorers have been able to make with their food supplies across the hummocks. A dirigible can make, say, fifteen miles an hour. Was not this the solution—provided the airship could carry fuel enough and remain inflated without losing gas by leakage? So Mr. Wellman had Louis Godard, the balloon maker of Paris, build him one of the largest airships of the Santos-Dumont type ever built—more egg-shaped than pencil-shaped, weighing 7,500 pounds and with lifting power of 16,000 pounds. This leaves a margin of 8,500 pounds for gasoline, food, men, motor-sledges, and wireless telegraph outfit. Since leakage is the chief evil to guard against, the gas-bag is made of seven thicknesses of silk, rubber, and cotton. The alternate skins of rubber are expected to keep the leakage down to 1½ per cent. a day or lower. The main motor when tested proved to give 100-horse-power instead of the 75 contracted for; so the ship is expected to surpass a speed of nineteen miles an hour with its two propellers working at full power. The plan was to start last summer from Spitzbergen with 5,500 pounds of gasoline, more than enough, Mr. Wellman believes, for the 1,200-mile trip. He counted on starting in a south wind that blows from Spitzbergen sometimes as long as forty hours. If his gas does not leak and he can hold his direction, he will doubtless succeed, when he makes his start next summer. Aeronauts fear that the shrinkage of his gas in the Arctic chill will give him trouble, but he guards against this by making his gas and inflating the balloon at a low temperature. A well-informed Arctic explorer points out, however, a more serious difficulty. No airship has ever traveled 1,200 miles under favorable conditions over a hospitable country—what is the hope for one in the frequent Arctic gales that blow across the desolate ice-floes? Mr. Wellman's ability to keep in touch with the world through wireless, however, ought at all events to insure him against the fate of André, who tried the feat in a balloon and perished.

The only other attempt to use the dirigibles practically is being carried on by the French War Department. They have bought two which they are now trying at Toul and at Verdun.

Costly, delicate, unwieldly, a toy for wealthy amateurs, perhaps a good scouting machine in war, and possibly a craft that explorers can use for quick trips, the dirigible airship will probably never be of any commercial value. It will doubtless be improved through the invention of more powerful engines and perhaps of an impervious covering for the gas-bag, but the wind will always be a fatal menace to it. Aeronauts who take flights in dirigibles carefully choose the right weather conditions for their excursions, and are even more restricted than the balloonists, who do not hesitate to sail in storms. Moreover, the machines are costly and fragile.

THE AEROPLANE

A far more fascinating effort than that of the balloonists or captains of dirigible airships has been the patient search for a means of imitating bird-flight. The story of Icarus is a Greek myth, but between the lines it tells of prehistoric Darius Greens who put on artificial wings, jumped, and tumbled. Rash men, or boys, have always been trying to fly. But since 1891 the quest has been so vigorous that more progress has been made than in all the previous ages.

Everyone has observed that birds of many kinds, gulls and hawks particularly, remain aloft for long periods without flapping their wings. They simply spread them and soar as a card flicked from the fingers will sail across a room. They could not remain afloat in one spot, in a calm, any more than the card could remain afloat when motionless, for like the card they are heavier than the air. They depend for support as a skater does who crosses thin ice, on moving fast enough to distribute their weight over a considerable area of the elastic cushion of the air in a very short time. Though there would not be enough resistance in a square foot of air, there is plenty in the ten, or twenty, or thirty, or more feet traversed in a second to offset the tendency to fall. At times a wind blowing against them replaces their own movement forward. A kite, too, remains aloft, because the wind offers a heavy resistance. So the aeroplane enthusiasts say: "Let us construct a machine with outspread wings and a propeller that will push it as fast as a bird sails, and it can soar. A rudder will give it direction."

But the air is as changeable and unsteady as the water that rushes down the Niagara rapids. It is full of eddies, whirlpools, up-currents and down-currents, endless shiftings in every direction. The changing currents blow even the birds hither and yon, and force them to tilt their wings now up, now down, and to lean their weight now this way, now that. So man's problem is first the easy one of making wings large enough to bear him up, and second the difficult one of maintaining equilibrium.

The first man to attain any considerable success was Otto Lilienthal, a German, who in 1891 constructed of willow sticks and cloth a machine consisting of a pair of wings and a tail (shown in the illustration), with which he made thousands of glides. Taking a running start from a hill, he would sail out on the air just as a flicked card sails. He kept his balance by swinging his feet in one direction or another. He really became an expert balancing acrobat. A freshening of the breeze would cause him to rise; and he landed lightly by raising his wings as a bird does. He could glide about 100 yards at great speed. But one day in 1896 he could not balance quickly enough to meet a sudden change in the wind, and the machine diving headlong, killed him. An Englishman named Pilcher tried the same kind of experiment, and he, too, was killed.

But scientific men were taking hold of the problem, and facts were soon proved that lifted the possibilities far above short glides by an acrobat. Two stand out with importance. Professor SamuelLangley, of the Smithsonian Institution, who had been making studies in flight and planning a motor-driven aeroplane, was confronted with the supposition that the faster a machine is driven through the air the more power it takes to drive it against the increasing air resistance. Now as high speed would be necessary in any form of aeroplane to push it against heavy winds, it looked as if light enough engines could never be built with sufficient power to drive one properly. He tried to find how rapid the increase of air resistance would be. Constructing a huge turntable many feet in diameter, he attached to a post at the circumference a spring-balance to which he hung a heavy brass plate. Then he had the turntable rapidly revolved, so that

the circumference was speeding 70 miles an hour. To his pleased surprise, the plate gradually rose in the air till at the end of its string it was following the post in a position almost horizontal, *and pulling less and less on the spring balance the faster it went.* In brief, the experiment showed that a flat body of some weight, if dragged—or pushed—through the air, meets less and less resistance as it increases its speed and approaches the horizontal. Other experiments showed that an aeroplane weighing 200 pounds would require only one horse-power to drive it 70 miles an hour.

Another supposition was that, however buoyant a light body might be when shot through the air as an aeroplane, no heavy body could be so driven. Hiram Maxim disposed of this. Constructing a huge machine with wings that spread 150 feet, he equipped it with a powerful engine and set it on a railroad track. Above the machine he placed another set of rails, and on the machine a set of wheels to fit them. The upper rails were a foot above the upper wheels. Starting the machine at one end of his track, he let it run at high speed with the wings slightly slanted. The aero plane not only rose from the lower rail and ran clinging to the upper one—showing that it was soaring—but it exerted so strong an upward pull that it ripped the trestle-work to pieces and itself went to smash in the wreck. M. Maxim had proved that an aeroplane can lift itself from the ground and start soaring from the impetus of its own locomotion, and that weight is no bar. *The machine weighed eight tons.*

These two big facts settled the direction and the certainty of progress. It is now known that an aeroplane of any weight, with wings comporting in size with the weight, can soar if it have propelling force enough. And it is also known that the faster it be driven the less resistance the air will offer to its advance, and the less power it will take to keep it going. The only problem that remained was—and is: "Can an aeroplane be constructed that can be balanced by a man riding in it?"

AEROPLANE FLIGHTS

Octave Chanute, an American still profoundly interested in the problem, said: "Yes —by moving the wings instead of moving the body of the operator, as Lilienthal did." He went out on the sand dunes thirty miles east of Chicago and tried two kinds of aeroplane—one of multiple surfaces, one of two. The two-surfaced machine proved the better. It was much like a box-kite looked at sidewise, with just the advance in stability over Lilienthal's wings that a box-kite has over a flat one. As the operator stood on the top of a dune ready to start, he had his elbows resting on a frame from which two wings with curved surfaces extended out horizontally to right and left. Above his head, like an awning, stretched another curved aeroplane parallel with the two lower wings. Assistants held up the framework at the ends. When all was ready, the operator ran and launched himself into the wind. In a graceful swoop, the machine would sail about one hundred yards in from eight to twelve seconds. A tail helped the stability, and the operator could change the slant of the lower wings slightly to meet wind gusts. Hundreds of glides were made in 1896 and 1897 with no accidents.

Then two brothers, Orville and Wilbur Wright, of Dayton, Ohio, taking a leaf from Mr. Chanute's book, began experiments on the sandhills at Kittyhawk, North Carolina, which they maintain have culminated in a successful flying machine. Their theory was that the way to learn to fly was to practise, not to make models. They built a machine much like Mr. Chanute's, but with important differences. It had an upper surface, and a lower surface separated into two movable wings, but instead of the tail it had a third smaller aeroplane in front, a little above the lower one. To minimize the resistance to the air, the operator lay down in the middle of the lower deck, thus bringing the third aeroplane just in front of his chin. Now, the whole art of balancing an aeroplane is to make the centre of gravity coincide with the centre of wind pressure. Lilienthal had tried to do this by chasing the changing centre of pressure with a movable centre of gravity. In the Wright machine the centre of gravity remained fixed. The idea was to chase it with the centre of pressure by changing the slant of the forward aeroplane and the two wings of the lower one as the wind pressure changed. With this device the brothers found that they could keep their balance better than any previous experimenters had been able to. In 1901 and 1902 they made many glides of more than 300 yards. In 1903 they were able to hover over one spot for a short time, in a fitful wind. The addition of a vertical rudder gave them control of direc-

tion. They proved conclusively that under favorable conditions a machine of the double-decked type, with movable curved wings and a horizontal front rudder, can be balanced.

Meanwhile Professor Langley was bringing to a close his years of incredibly patient work on a motor-driven aeroplane. In 1896 he had built a machine consisting of a cylinder-like frame from which slanted upward, in a very flat V-shape, four wings like those of a dragon-fly. Launching this from a house-boat on the Potomac, he had the thrill of seeing it soar three-quarters of a mile before its power gave out. Straightway he began on a replica of this, large enough to sustain a man. His patience in beginning again, and again, and yet again, when successive accidents and difficulties delayed his progress, shows why flight was not mastered long ago. It costs more time, effort, and worry to construct experimental machines than men are willing to give. Through an accident at the launching, this man-size aerodrome was precipitated into the Potomac without even soaring a foot, and was ruined. The Government appropriation which Langley had was gone, he had no more funds to experiment with, and he was obliged to drop his investigation. But he died believing that a machine of the type he built can soar—and perhaps it can. The model did.

At all events, the results of Langley's experiments are the facts on which dozens of other men are building. A so-called Concourse of Aviation was held in Paris last year at which models were flown with some success. Senor Alvarez of Brazil built one like a bird with outspread wings, which dropped from a balloon in England, sailed for a mile, and then alighted gently. Professor J. J. Montgomery, of Santa Clara, California, built a machine of many planes in which an aeronaut dropped successfully from a balloon. In a second attempt the wings broke and the aeronaut was smashed to pieces by the fall. Mr. Israel Ludlow, of New York, constructed the aeroplane shown in the illustrations, which was launched kite-fashion with a rope pulled by an automobile. At the fifth trial in August of last year it fell from a height of 100 feet, but the aeronaut, landing unhurt, tried it again in October, pulled by a tug-boat down the Hudson River. It acted like a kite, and sailed along buoyantly until the tug had to stop for a passing ferryboat, whereupon it settled down gently.

The Wrights, however, were gradually increasing their skill in handling their gliding machine, and in 1904 they added a motor. For the further story of their experiments we have only the word of one of them, who has reported to the Aeronautical Society of Great Britain that late last year, in a lonely swamp near Dayton, Ohio, a new power-equipped machine sailed twenty-four miles in thirty-eight minutes and did not come down till the fuel of the engine gave out. The two brothers are said to have increased the stability of their machine by making a joint in the movable wings so that the outer end can be lifted, as a bird's wing bends, to relieve the pressure of gusts of wind. If this be true, they have a device for shifting the centre of pressure from side to side, as well as forward and back by means of the horizontal front rudder. These shifts, if they can be made rapidly enough, solve the problem of equilibrium—and the successful flying machine has arrived. The dirigible airship, through the use of automobile engines, which now can be made as light as 2.2 pounds per horse-power, has solved the power and the steering problems. The secrecy that surrounds the flights of the Wright brothers—for they maintain that they have made many—is said to be due to the sale of their discovery to the French Government.

THE HELICOPTERE

Many experimenters assert, however, that the aeroplane is not the flying machine of the future. In this place they put the helicoptere—a machine in which horizontal propellers will revolve rapidly, pushing the air downward and thus rising vertically. It is to this form of airship that Santos-Dumont is now giving considerable attention. The accompanying photograph shows a helicoptere with which he is experimenting. One advantage claimed for this type of lifting machine is that it can rise directly from the spot where it rests, and remain suspended as long as the propellers keep working, regardless of the wind. A more important advantage is that a helicoptere will balance itself if the propellers are properly placed. Additional propellers are counted on to give the machine direction and speed. The propeller blades are expected to act as parachutes, letting the machine down gently if the motor stop through accident. The helicoptere for lifting power and stability: the aeroplane for speed! It is probable that the airship that we shall see will be aeroplane and helicoptere combined.

THE SOUTH AFRICAN CONSTITUTION

ENGLAND'S EFFORT TO FRAME A YOKE THAT WILL GALL NEITHER BOER NOR BRITON, KAFFIR NOR ORIENTAL—THE PARTY LINES AND LEADERS—THE "YELLOW PERIL" GIVING PLACE TO THE PERIL OF THE BLACK AND THE BROWN

BY

H. W. MASSINGHAM

(FORMERLY EDITOR OF THE LONDON "DAILY CHRONICLE")

IT IS a recurring fact in English history that the Mother Country, which has merely an unwritten or "blind" constitution, should always be conferring on its self-governing dependencies constitutions which are written and "fixed." So far as its greater self-governing areas are concerned—Canada and Australia—Great Britain's work is done. It has fixed the lines of confederation. In the case of Australia, it has done little more than put its signature to a scheme for which colonial statesmen were responsible, and in which, on the vital question of interpretation of state law, England has had to yield its will to theirs.

Now Great Britain has to face a problem of a different character. South Africa is not yet ripe for confederation, or, at least, for unification. For some time to come its population —English, Dutch, East Indian, native—scattered over a vast but largely barren territory, will have to carry the burden of five separate governments more or less at variance with each other on the vital problems of taxation and railway administration. But within the next few months the circle of self-governing South African states will be complete, save only for the half-developed and more than half-ruined Rhodesia.

Every constitutional scheme for South Africa must take into account the vital difference between the Dutch and the English population. Broadly speaking, the Dutch are born, are educated, are married, rear their families, and die in South Africa. The entire horizon of their lives is bounded by the blue sky and the conical or razor-backed kopjes that shut in the South African veldt. They are, in the main, country folk; they look like English farmers of the eastern counties and resemble them much in character. The English, on the other hand, are town dwellers—merchants, traders, speculators, promoters, birds of passage. They usually come to South Africa to make money, leaving all the greater attractions of life behind them. Johannesburg and its dependent townships are largely communities of bachelors. Men constitute three out of five of the residents, and of the adult population the males are as two to one. Rent is so high as to discourage marriage in the Rand towns. Only one or two of the mining magnates fix their homes absolutely in South Africa.

The new constitution was framed only after a battle royal between the spokesmen of the two nationalities. General Smuts, one of the most brilliant commanders of the war and one of the best heads in South Africa, spoke informally for his countrymen while the British Cabinet debated the question, and deputation after deputation representing the great houses put the mine-owners' case before Lord Elgin, the Colonial Secretary. In the end, compromise ruled the day. The number of representatives was enlarged and the old back-country districts had restored to them the representation which they enjoyed under the Dutch rule. Manhood suffrage was set up and property qualifications swept away. The Dutch language was placed on an equality with the English in the new assembly. Finally, the Intercolonial Council was abolished, after a time limit, and all restrictions on the critical and controlling powers of the assembly were removed. The new Transvaal government will stand or fall by its own will, and its ministers will yield undivided responsibility to it.

THE BALANCE OF POWER

One problem, however, remained—the distribution of political power. To settle this point, the Cabinet sent out a powerful committee which practically obtained a basis of agreement between the Boers' organization on the one hand, working to some extent with

the moderate English, and the mine-owner's party on the other. The settlement was, on the whole, favorable to the Rand. The sixty miles of gold reef, sown with scattered townships, with Johannesburg as the centre, are to get 34 votes. Pretoria, the capital and the seat of the official class, is to have 6; and the rest of the country is to have 29.

On the face of it, this looks as if the government of the Transvaal were definitely given over to the mine owners and that a population of about 114,000, whose main roots lie in Europe rather than Africa, are to outweigh the 175,000 native-born whites. Moreover, the country districts are not absolutely solid for the Dutch. Barberton, for example, is a mining community predominately English; Klerksdorp has an English majority. If, therefore, the British forces were purely under the control of the mining houses, the Dutch would be submerged. Furthermore, a second chamber was created in harmony with the general (though not invariable) practice of British colonial constitutions. It would seem, therefore, as if the money power were seated firmly in the saddle.

This, however, is not the fact. In the first place, the second chamber will be nominated by the Crown at home, and Lord Selborne, High Commissioner for British South Africa, will have no voice in the first selection of names, though his advice may be taken on them. It will, therefore, consist not of the nominees of the mining houses but, in the main, of non-partizans or representative men drawn from all sources. In the second place, Pretoria is not Johannesburg. It is the seat of the English officials and of the Dutch minority, including many of the leading Boer families. The former are not, as a body, identified with the mine owners; they stand socially apart from them, and sometimes offend them by "superior" airs. Some of them, at least, would not willingly lend themselves to the creation of a purely capitalistic state. The six Pretoria seats, therefore, would probably be divided between the moderate and official English and Dutch. The heads of the official world—men like Sir Richard Solomon, the present Attorney-General and a member of the Schreiner Cabinet which resisted the first approaches of the Boer war, and Mr. Duncan, the permanent Secretary, will descend into the arena and bid for power. The Dutch will probably support them, for Sir Richard Solomon is, on the whole, a most popular and fair-minded servant of the ruling power. The Dutch, therefore, standing solid as they always do, are already in alliance with the new National Association and, in some degree, I imagine, with the Labor party.

INDUSTRIAL CHANGES IN THE RAND

This new division of parties extends to the Rand itself. The Rand is no longer united for the mine owners. The causes of the estrangement are various. A section of the Labor party and its leaders never approved the war. A still larger body, practically the entire organized forces, oppose Chinese labor and have watched its development with mingled hate and fear. The miners, who work on the contract system and are superintendents of labor rather than manual workers, prefer the Kaffir. He is more manageable, better tempered, and, on the whole, more efficient. A third cause of the unpopularity of the great houses is the depression which followed the war. The days of booms are over, probably forever. Johannesburg, indeed, has ceased to be the centre of serious speculation.

Meanwhile, the entire problem of the mining of the gold-bearing strata of the Rand has been changed. Great fortunes have been made out of the outcrops on the shallow portions of the reef, but when shafts have to be sunk 3,000 or 4,000 feet in order to reach the deep levels, a totally new mining proposition presents itself. New stores of capital were wanted and Chinese labor was to attract it. But the capital does not come. The great houses took too much in vendors' scrip, which they sold at high premium, reaping enormous profits, while working capital was provided in quite insufficient quantities. Now confidence is gone; the public comes into the Kaffir market mainly to sell. And yet, if the development of the Rand is to proceed as rapidly as the great houses desire, and their theories of labor are correct, not 60,000 but 300,000 Chinamen must be imported. This the white miners will never tolerate and now that the government has decided to abolish the Chinese Ordinance and, under the new Constitution, to disallow any law imposing servile conditions of service or residence, they will throw in their lot with the Boers and the National Association.

Already, therefore, within four years of the close of the war, the aspect of South African politics is transformed. Power, under the new

constitution, will probably lie in a coalition between the Dutch and the moderate English element—led by the two Solomons on the one hand, both of them old South African politicians trained at the Cape, and Generals Botha and Smuts, two of the heroes of the war, on the other.

The constitution, therefore, will be worked, in the main, by two parties. One, the Progressives, will stand for the great mining houses, Eckstein the greatest of all, with Sir Percy Fitzpatrick and Mr. Lionel Phillips as its chief representatives. The opposing party will be a mixed one—Dutch and English—and will consist of three wings. The first will be the Boers organized as members of *Het Volk* (the people). General Botha, General Smuts, General Beyers, representing the extremists; Mr. Esoelen, a brilliant lawyer and formerly a judge of the Dutch court; Mr. de Villiers, one of the rising statesmen of Dutch South Africa; and Delaney, now retired, Cincinnatus-like, to his farm, but beloved of both races—will be their leading men.

The Labor party will have Mr. Whiteside, an Australian of culture and capacity, as its ablest leader. The leaders of the new National Association will be four men widely different in character but all of considerable power. Mr. E. P. Solomon will be the cautious moderator of this group. Behind him will be Mr. Hull, a Johannesburg lawyer, a man of great oratorical gifts and iron force of will; Mr. Cresswell, the soul of honor and disinterestedness and the leader of the movement to replace the Chinese by a larger use of white skilled labor; and Mr. Wybergh, the late Commissioner of Mines, a trifle hot-headed, perhaps, but zealous and fine tempered. These groups will be strong enough to elect the first ministry unless, indeed, the great economic and social forces that the mine owners wield are able to crush out the formidable movement of revolt. They will almost certainly coöperate with the Home Government in extirpating Chinese labor, though Sir Richard Solomon, the probable Premier, has been a considerable agent in its introduction. But Sir Richard is not an inflexible politician.

THE RECONSTRUCTED BOERS

But the main centre of interest in South African politics is the attitude of the Dutch. A great change has come over the Boers since the war. The farmers of the two conquered states have been terribly impoverished. They have obtained only about 10 per cent. (two shillings in the £) on the purely arbitrary assessment of their war losses made by the Pretoria Commission. Draught and disease have ravaged their flocks and herds, already sadly thinned by the war. But they have shown remarkable firmness, moderation, and unity of spirit. The old divisions between the Dutch of Cape Colony and those of the Orange Colony and of the Transvaal have disappeared, and now there is complete understanding among personalities and organizations—the "Bond" in Cape Colony, the "People's Union" in the Orange Colony, and "The People" in the Transvaal. The war has given new leaders and developed fresh talents—Mr. Malan in the Cape, Judge Hertzog in Orange Colony, Smuts and Beyers in the Transvaal—while in the background stand the older champions, such as Jan Hofmeyer and Steyn—his body crippled by his sufferings on the veldt but his mind clear and his purpose steady. Steyn, indeed, is perhaps the dominant figure of the Dutch Left, the more irreconcilable element in the Boer population.

Irreconcilability, however, is not the note of Dutch nationalism. In all the Colony states, the Dutchmen have turned to their more sympathetic English compatriots. Purely racial issues are avoided and South Africa for the South Africans—English or Dutch—is the new motto. The models chosen are Canada and Australia, with ministers responsible to the Crown, whose representatives are governed by the strictly constitutional methods of the English monarchy. No party in South Africa is likely in the future to call for the intervention of a British army. All are sick of a paternal or Crown government.

The man who is most responsible for this moderate policy of the Boers after the war is Botha, the commander of the Dutch forces, the man whose plans of penetrating into Natal after the victory before Ladysmith might have changed the fortune of the campaign. Smuts is the intellectual leader of the Boer party. His campaign with a small commando into the heart of the Colony was one of the most daring and original feats of the war, and his keen, subtle temperament and highly trained intellect are among the chief assets of Dutch South Africa. But Smuts is a townsman; Botha a countryman. In person as in mind, Botha is a farmer-statesman. Large

and loose of limb, his pleasant face redeemed from heaviness by the bright eyes and dignity of expression; sweet-tempered, a trifle easy-going, but with a capacious and clear intelligence, Botha was well fitted to lead his people through their time of trial. He kept them united and organized, behaved faultlessly to his conquerors, discouraged all secret movements, mantained his party on strictly constitutional lines. The result is that they are ripe for constitutional government. Botha and his friends meet the leading mine owners at the Rand Club on affable, if not intimate terms, and when the old enemies gather in the great brownstone Palace at Pretoria, where Kruger's Raad assembled, there will be all the elements of an orderly Colonial Parliament.

THE COLOR LINE IN SOUTH AFRICA

What of the greatest problem of all? What of the real South Africa—the land of the Black and the Brown men? The native occupies a strange position. He is in a majority over the white man of four to one. He is healthy, and has ambitions. He runs a newspaper or two and has fluent writers on their staffs. He has mixed blood, mixed both with the old Dutch slave-holding settlers and with the Englishmen; and though in the northern states the Dutch laws have affixed heavy penalties to unions, legitimate or illegitimate, with the native races, the bastard colored people in Cape Colony have a considerable place in the economy of the state. They vote on a mixed educational and property franchise, and can turn elections. Sir Richard Solomon, one of the few "Negrophiles" in South African politics—represented a Cape constituency which they controlled.

They have, moreover, the immense advantage of being, with the pure Kaffir or Bantu races, the manual workers of South Africa. The white man is a superintendent of labor, and he fills the skilled, responsible positions in the higher ranks of industry. But the black man is the working miner in the gold and diamond fields. He does nearly all the domestic service and the hard work. The Asiatics—mostly Malays and East Indians—monopolize much of the small trading, and make the best waiters and personal attendants in South Africa. What is to be the future of these races? Neither branch of the dominant white population loves them.

The black man, struggling out of savagery and paganism, and half in the old tribal system and half out of it, is feared in proportion as he aspires to some kind of betterment—higher wages, an educational system—which is practically denied to him in the Transvaal and Orange Colonies—or escape from the white missionary's tutelage in religion. The color prejudice extends to the Asiatic races, and is specially keen in Natal and the Transvaal. No hotel will take in even respected East Indians, the professional classes. In the Cape the colored people are the mainstay of the turf. In Johannesburg no man of color is admitted to the grounds of that famous centre of the sporting element, the Wanderers' Club. Rigid pass laws control the movements of the natives, and after the war the whole system of Dutch legislation which enforces the inferiority of the black man was retained and strengthened.

The gates of the new Transvaal constitution are therefore absolutely barred to the black man and also to the other colored races. Here comes the first great British difficulty, the inevitable source of friction. The term, "native" has been stretched so as to include not only the aboriginal races of South Africa, which it was first intended to cover, but practically the whole non-white population. Native East Indians, subjects of the King, will be included in it, and Dutchmen and Englishmen in the new Assembly will do nothing to establish any form of political or social equality. Federation or unification will not improve their position, for the more liberal policy of the Cape Colony will sink under the more exclusive ideas of the northern politicians. On the other hand, the constitution expressly reserves native questions for the Crown, and no oppressive local legislation is likely to escape its veto.

Here, in my view, lies the more immediate danger of the new constitutional development in South Africa. England has one view on the native question, while South Africa has another. Within five years time the Chinaman, with his inscrutable smile, will have almost disappeared from the Rand that he has tormented. But the black man and the brown man remain, growing faster than their white overlords; getting little good from Christianity, but assimilating the outer forms of civilization. And against their progress stands a rock-barrier of white South African prejudice, against which I fear that English ideas will battle in vain.

A NEW NEW YORK

HOW THE CITY IS BEING RAPIDLY CHANGED BY NEW KINDS OF BUILDINGS—A DISTINCT TENDENCY TOWARD MAKING NEW YORK MORE BEAUTIFUL AS IT GROWS GREATER

BY

J. M. BOWLES

A WELL-KNOWN New York architect, before a convention of fellow-craftsmen last winter, said that it was necessary to make a tour of New York City every two weeks in order to keep up with the progress of the building art. As a matter of fact, the buildings actually under way at the time this article is being written would in themselves make a city of no mean proportions. Better still, they would make a city of great architectural beauty.

At the foot of Broadway is the new Custom House, the design of Mr. Cass Gilbert. It is in the style of the Italian Renaissance and is an imposing mass of Maine granite. Decorative sculpture is being used on this building more freely than on any other structure in the city. Over each of the forty-four great stone columns which surround the structure is the head of Hermes, god of Commerce; over the first-story windows are heads representing the eight types of mankind; and at the sixth floor on the Bowling Green façade are twelve heroic figures representing famous ancient and modern seafaring nations. They were designed by Messrs. Lukeman, Bitter, Tonetti, Jaegers, Ruckstuhl, Grafly, Elwell, Gelert, and Louis St. Gaudens. In front of the building are four great groups of three figures each, "The Four Continents," by Mr. D. C. French. The building will cost $5,000,000, but "Uncle Sam" has collected $200,000,000 in duties at this port in one year.

THE HALL OF RECORDS

To the north of City Hall Park is the much discussed Hall of Records, begun by a Mr. Lord, an architect accepted in the organizations and councils of the profession. At his death it was turned over for completion to two clever young Tammany men, Messrs. Horgan and Slattery. One of their first acts was to free themselves from all responsibility so far as the sculpture was concerned by lumping it and giving to one sculptor, Mr. Philip Martiny, a contract for $80,000, covering all the sculpture for the building. This method was new to New York and resulted in many clashes with the Municipal Art Commission, which has the power to veto although it cannot take the initiative. Although Mr. Martiny has not attempted to do all these statues himself, it is possible that the method may result in a certain pleasing unity of effect in these decorations. Some of them have historical interest; for instance, the statues of a number of the famous mayors of New York, on the main façade at the sixth floor. There are figures in heroic size at the main entrances and in the vestibules—Commerce, Industry, Navigation, Medicine, Tradition, Chemistry, Memory, and Electricity—and the building is lavishly decorated throughout with fine marble, bronze, and mosaic. A grand entrance lobby with a white marble staircase reaches to the roof; the two chief court-rooms are finished in English walnut and African mahogany, and enormous bills have been sent in for equipments of much elegance. The cost of the building and furnishings will be about $6,500,000.

PUBLIC LIBRARIES AND HOSPITALS

At the new Public Library—by Messrs. Carrère & Hastings—on Fifth Avenue, from Fortieth to Forty-second streets, sculpture is as yet conspicuously absent, but the building of white marble is itself a work of art. However, ample spaces have been left for the enrichment of the architecture. The building will cost nearly $5,000,000.

The new buildings for the various Carnegie branch libraries, auxiliaries of the main library, are blossoming out all over the city. The designs are under the supervision of a commission composed of Messrs. McKim, Mead, & White, Messrs. Babb, Cook & Willard,

and Messrs. Carrère & Hastings. Thus far, they are all conveniently arranged, flooded with light, and architecturally correct. There will eventually be sixty-five of these Carnegie branches in Greater New York.

There is also a large plan for a central system of hospitals in the five boroughs which compose Greater New York. The buildings are to be of uniform architecture, the service is to be organized on a scheme of unity, and all are to be under the control of one department of the city government. The new Bellevue Hospital, to cost at least $8,500,000, will be a building of grandeur. It is a pity, from the standpoint of civic beauty, that it will not be in the centre of the city instead of at the uttermost limit of the upper east side. Messrs. McKim, Mead & White are the architects. A feature of the hospital will be its open-airiness and general sunshiny aspect. Every ward will have its large balconies, reached directly from the room by low windows, and some of them will be large enough to accommodate all of the patients of the ward at one time. There will also be a number of roof-gardens which can be enclosed with glass in winter. On the water side the walls are practically all windows, so that a patient will only have to turn his head to see the constantly changing panorama on that great thoroughfare, the East River. The Board of Estimate and Apportionment went about their task in the right way. In 1903 they appropriated the sum of $75,000 for the preparation of plans and specifications for a new Bellevue, and as a result have probably the very best designs that could be secured.

FEDERAL AND MUNICIPAL BUILDINGS

On Eighth Avenue, over the tracks of the new Pennsylvania Terminal, is to be another Federal building which will cost almost as much as the Custom House. Congress, in the eleventh hour of the last session, appropriated $1,700,000 for the site and $5,000,000 for the building of a new Post Office for New York City. It will extend from Thirty-first to Thirty-third Street, and will offer another magnificent opportunity for decorative sculpture and painting.

The plans for a group of municipal buildings about City Hall Park, forming a "civic centre" there, are so vast that it is impossible to say what will be the result; still they are not visionary and the Hall of Records is a good beginning. A $3,000,000 Health Building will probably be erected and there is a definite project for a new Court House, eight times the size of the present building. Besides, there is serious talk of an immense City Administration Building, and an enormous terminal for Brooklyn Bridge, with a 45-story campanile to contain all of the city's miscellaneous offices. This structure alone would cost over $10,000,000, but it would save $500,000 a year in rentals. The total outlay necessary to carry out these improvements would be over $50,000,000.

The late Stanford White planned for Brooklyn a $4,000,000 Municipal Building, and Brooklyn is also to have a new $2,000,000 public library on Prospect Park Plaza. The design of Mr. R. R. Almirall was selected and he was sent to Europe to study public libraries before actually commencing work. Brooklyn is also to have a dainty white marble Health Building designed by Mr. Bradford L. Gilbert, which it is said will resemble the new Manhattan Public Library, although it will cost only $200,000.

PUBLIC BATHS AND RECREATION PIERS

Minor public buildings in Manhattan, which would be of importance in almost any other city, are the new Whitehall Ferry Terminal at the Battery, which is to cost $1,500,000, and which the Art Commission intends shall be "dignified and monumental, like the new Pennsylvania and Grand Central Stations." An interesting feature of this structure will be an enormous "recreation space" on the roof, there being no recreation pier at this point. Recently $700,000 was paid for a site opposite Central Market for a handsome new Police Headquarters, and work has already been commenced on a $150,000 mediæval fortress for the "Tenderloin" police. Congress has appropriated $350,000 for a new Assay Office in New York, the fumes of the chemicals used in the work for a quarter of a century having rendered the present building positively dangerous.

Better living has also been the incentive in the erection of new public baths, of good design, and appropriations have been made for recreation piers, not so good. But a vast advance is coming in the construction of these pavilions, which have become a vital part of the city's life. It is coming to be realized that every one should support a roof-garden, and that provision should be made for enclosing the piers so they can be used in winter time; perhaps

they might relieve the frightful pressure for sittings in our public schools. Here might be mentioned also the $20,000,000 which it is said New York is spending on docks, which Germany has shown can have architectural beauty as well as stability, a lesson we have been slow in learning.

GREAT BRIDGES AND COLLEGES

Of great bridges one to Brooklyn is so recent that its terminal is not yet built; two others to the Long Island shore are in process of construction; the Henry Hudson Memorial Bridge is an assured fact; and a railroad bridge to New Jersey is in the committee stage. For the terminal to the Williamsburg Bridge $1,250,000 has been appropriated and much remains to be done to the approaches. The total cost will be $20,000,000. The Manhattan Bridge, starting from the Bowery at Canal Street, will be six times the capacity of the Brooklyn Bridge, is to be finished within four years, and will cost $8,000,000. Through trains from Harlem to Coney Island are expected after its completion. The Blackwell's Island Bridge, starting from the foot of East Fifty-ninth Street, will cost $12,500,000. For it are being made castings of forty tons each, the largest ever made in this country. The lines of this bridge are especially fine. Spacious plazas are planned for the approaches of all the new bridges. At the mouth of the Harlem River, at Spuyten Duyvil, is to be the city's tribute to Henry Hudson on the occasion of the third centennial of his discovery. Although somewhat plain, it is fundamentally good in its proportions and it is possible that during the progress of the work the authorities will appropriate more money and make it beautiful. At present, the cost is estimated at from $2,000,000 to $3,500,000, and $5,500,000 more will be spent on approaches. When the improvements already planned in connection with this memorial bridge are finished, Riverside Drive will extend from Seventy-second Street to Yonkers.

Another worthy memorial will be that to the late Andrew H. Green, "the father of Greater New York." It will be appropriately located at the Seventh Avenue and One Hundred and Tenth Street entrance to Central Park of which he is also said to have been the parent. The expense is now estimated at $100,000, but it may be increased by the addition of decorative sculpture. Of minor memorials there are so many that they cease to be interesting when considered in connection with the enterprises of such magnitude as those mentioned above.

Although unfinished, one of the most beautiful group of buildings now owned by the city is located on the high and spacious plot which belongs to the College of the City of New York, and which extends from Amsterdam Avenue to St. Nicholas Terrace, and from 136th Street to 140th Street. There is a series of five great structures designed in Tudor Gothic by Mr. George B. Post, with extraordinary decorations, sculptured figures typifying the arts and sciences. The Oxford effect will be enhanced by vines now being planted. The main building is two blocks long, has a tower 200 feet high, and stands directly on the crest of the terrace, which at this point rises eighty feet above St. Nicholas Avenue. The buildings are connected by subways. A remarkable effect has been obtained with an appropriation of only $2,600,000 for buildings, although the total cost of the enterprise will be about $5,000,000.

The $8,000,000 appropriated by the city for school buildings would seem enough, but the Board of Education asked for $14,000,000. Many of the new schools are thoroughly fine in design and some of them are receiving mural decorations by first-class artists, notably the Mt. Morris High School.

Another handsome educational building is Hamilton Hall, the new academic building at Columbia University, designed by Messrs. McKim, Mead & White. It is in course of construction and will face the beautiful Library by the same architects. St. Paul's Chapel, at Columbia, by Messrs. Howells & Stokes, is almost completed. It is in the style of the churches of northern Italy.

The interior woodwork, which is now being installed—choir stalls, reredos, organ-case and furniture—has been carved in Italy, and represents two years' work. The immense stadium for Columbia, costing $1,000,000 and extending on "made" land into the Hudson as far as the pier-head line, will undoubtedly be built. It will also give a magnificent water approach to the city for use on occasions of state, and to Columbia a much-needed athletic field.

MUSEUMS OF ART AND HISTORY

Three new museum buildings are nearing completion in New York, the Metropolitan Museum is receiving important additions,

and the Brooklyn Institute of Arts and Sciences has recently opened a new section of its structure. Filling the block front of Central Park West from Seventy-sixth to Seventy-seventh Streets is the new $800,000 home of the New York Historical Society, which has, in addition to its treasures relating to American history, a collection of old paintings as valuable as it is little known. Overlooking the Hudson, at Broadway and 156th Street, is the new building of the Hispanic Society, an institute free to the public through the generosity of Mr. Archer M. Huntington. The land, building, and endowment represent about $1,000,000. Next door, on land given by Mr. Huntington, is a small but attractive museum and club building for the Numismatic Society, costing $50,000. The new section of the Brooklyn Institute's building, by Messrs. McKim, Mead & White, with its great vaulted stone columns, arches, and roof, is more imposing than any part of the Metropolitan Museum yet built. But the new north wing of the Metropolitan, now under way and by the same architects, will probably be still finer. It adjoins the present section facing Fifth Avenue, is 137 feet long, and will cost $400,000. The south wing will follow and the building will then extend 1,460 feet along Fifth Avenue, from Eightieth to Eighty-fifth Street, and will form one-fourth of the complete structure, which will have cost $22,000,000 and will cover eight acres. The Museum is already the largest in the world maintained without subsidy from city or state.

The National Academy of Design has $200,000 toward the $800,000 marble building for its valuable collections; it is to be built on Morningside Heights, facing the Cathedral of St. John the Divine.

MANY NOTABLE CHURCHES

In new churches, this Cathedral still leads. A temporary structure is soon to be erected within its walls. Three more great arches are to be put up, making with the one now standing a square space that will be roofed over and form the main part of the new church. It will seat 5,000 and will be the largest in New York. The choir of the Cathedral is under construction, and several of the seven chapels which surround the chancel are either almost completed or under way. About $2,000,000 has been spent to date and the entire building will require about $15,000,000. A group of buildings for a resident school for the choir of the cathedral, with houses for the organist and precentor, is planned. It will need an endowment of $1,000,000. The trustees of Grace Church, at Broadway and Tenth Street, are to build an income-producing structure at the back of the property on the corner of Tenth Street. Its architecture will conform to that of the picturesque church, and will increase the civic beauty of this spot. Brooklyn is to have a Roman Catholic Cathedral on a hill overlooking Flatbush, Flatlands, and Jamaica Bay, $250,000 having just been paid for the site. It will probably follow closely the lines of Rouen Cathedral. In Manhattan half a million will be spent for a new St. Michæl's to replace the one torn down to make way for the Pennsylvania Station. The Westminster Presbyterian Church is planning a unique ten-story working church, with dormitories, a flat for the pastor, a court with gardens and fountains, and a façade which will be a reproduction of that of Westminster Abbey.

The new church for Dr. Parkhurst, at the corner of Madison Avenue and Twenty-fourth Street, designed by the late Stanford White, is almost ready for use. It is early Christian in style, with a touch of the Byzantine. It is the subject of much discussion on account of the use of color on the exterior and also because of the difficulty of the problem submitted, that of building a modern church directly in front of a skyscraper. The interior decorations are being done under the direction of Mr. Louis C. Tiffany. One of the most important projects in New York, is the new St. Thomas at Fifth Avenue and Fifty-third Street, replacing the church destroyed by fire. The award has been given to Messrs. Cram, Goodhue & Ferguson, who are making the new West Point. They have planned a splendid specimen of pure Gothic architecture, which will cost at least $1,000,000.

GREAT RAILROAD TERMINALS

The volume of high-class commercial structures is bewildering. In this class properly come semi-public buildings like the Pennsylvania and Grand Central Stations, which are business investments, although built for public use.

The station proper of the Pennsylvania will cover four city blocks, and will be the most expensive building in the state with the exception of the Capitol at Albany. Messrs.

McKim, Mead & White are the architects. It will be 772 feet long and 433 feet wide, and the contract with the Fuller Company calls for the expenditure of about $25,000,000. Including the trainsheds and other minor structures, twenty-eight acres of space will be covered, and the total cost of the improvements will run up to $50,000,000. The Grand Central Station and sheds will cover nineteen city blocks, and in the waiting room is to be the largest staircase in the world, leading to a spacious balcony overlooking fifty tracks. The architects are Messrs. Warren & Wetmore, and in both of these vast enterprises the aim has been to make the buildings both beautiful and useful.

These stations will be partly underground. At Church and Cortlandt streets will be one wholly underground. Little has been heard of it and yet, including an office building above, it will cost $8,000,000. It is to be the terminal of the tunnel under the Hudson River of the Hudson & Manhattan Railroad Company.

SKYSCRAPERS AND DEPARTMENT STORES

In office buildings proper, the City Investing Building, on lower Broadway, representing an investment of $7,000,000, probably leads. It has a magnificent arcade 315 feet long and from 37 to 52 feet wide. The architect is Mr. Francis H. Kimball. Two sensationally high towers will also attract popular attention. That of the addition to the Singer building, at Broadway and Liberty Streets, is to be thirty-eight feet higher than the Washington monument, which has hitherto held the record. It will contain forty-one full stories and will cost $1,500,000. On the site of Dr. Parkhurst's old church is to be another tower almost as high—designed by Messrs. Le Brun & Sons—a part of the Metropolitan Life Building, which has now almost filled the block bounded by Madison Avenue, Fourth Avenue, Twenty-third and Twenty-fourth Streets. It is said to be the largest office building in the world. The United States Express Building and the "Trinity Twin" being added to the recent Trinity Building, overlooking Trinity graveyard, the Lawyers' Title Insurance Building, and the new building on Broadway for the Knickerbocker Trust Company are all important. Each has cost many millions and in each is an effort being made for beauty. Altogether, there are fifteen new office buildings, costing over $40,000,000, either under way or soon to be built in the downtown district.

The new Wanamaker's, at Broadway, Fourth Avenue, Astor Place, and Ninth Street, the largest of the new shop buildings, is extremely simple and dignified. It is by Mr. D. H. Burnham, has thirty-two acres of floor space, and cost $3,500,000. The new white marble building for Tiffany & Company, at Fifth Avenue and Thirty-eighth Street, is considered the finest commercial structure in the world. It is by Messrs. McKim, Mead & White, as is also the equally beautiful, though smaller building of the Gorham Company, on the corner below. The white stone palace for Altman & Co., by Messrs. Trowbridge and Livingston, on the important location diagonally across from the Waldorf-Astoria and reaching to Thirty-fifth Street, is almost too palace-like for a dry goods store. The new Claflin's on West Thirty-fourth Street is also elegant. The new Day and Night Bank, on Fifth Avenue at the corner of Forty-fourth Street, with its bronze doors designed by Mr. Gutzon Borglum, is a welcome addition to that thoroughfare of the rich.

HOTELS AND APARTMENT HOUSES

Rich in sculptured decoration is the new Hotel Belmont, by Messrs. Warren & Wetmore, opposite the Grand Central Station. The Hotel Knickerbocker at the corner of Broadway and Forty-second Street, soon to be open, also recognizes the value of objects of art as an investment. It is claimed that each represents an outlay of about $5,000,000. The Hotel Astor, Times Square, itself new, is to be doubled in size; when finished it will represent an investment of $7,000,000. At Fifth Avenue and Fifty-ninth Street, the new Hotel Plaza is rapidly rising—another $5,000,000 American home, with nearly 1,300 rooms. It was planned by Mr. H. J. Hardenburgh, architect of the Waldorf-Astoria and the Hotel Manhattan. A feature will be made of a great court in which will be a driveway and an Italian garden. Uptown are to be many new apartment hotels, including one for William Waldorf Astor covering an entire block, and several costly structures facing Central Park, whose façades extend the length of a block. There will also be additions to the group of unique studio apartment buildings on West Sixty-seventh Street, near the Park, occupied and partly

owned by artists. These luxurious and expensive structures disprove the assertion that art does not pay. The plans for the newest, which is to cost $275,000, have been filed by Mr. R. W. Vonnoh, a portrait painter. The marble entrance hall of the one last opened, the Central Park Studio Building, has elaborate mural paintings by Messrs. R. V. V. Sewell and Frank V. Du Mond. The lavish use of expensive materials, of bronze, and of rare marbles is becoming so general in buildings erected for investment that the next step can hardly fail to be as liberal a use of paintings and sculptures.

One of the most beautiful buildings in New York is Messrs. McKim, Mead & White's New Colony Club, on Madison Avenue between Thirtieth and Thirty-first Streets; and it is built of brick. The National Arts Club is remodeling the old mansion of Samuel J. Tilden in Gramercy Park and building back of it a twelve-story annex designed by Mr. George B. Post, the architect of the College of the City of New York. The second Naval Battalion of Brooklyn is building a beautiful new armory in which will be some extraordinary wall paintings by Mr. R. T. Willis.

PALACES FOR THE RICH

Beautiful private houses arise like magic. In the old Dutch façade of one on Park Avenue, near Thirty-sixth Street, the strong color which we need to liven the vistas of our too gray streets is used successfully. There are scores upon which money is lavished, but the Schwab and the Clark palaces go beyond all the rest. That of Senator Clark at Fifth Avenue and Seventy-seventh Street, has been building for six years, and the cost is estimated at all the way from $5,000,000 to $10,000,000. It is by Messrs. Lord, Howlett & Hull, associated with Mr. Kenneth Murchesen, Jr. The Senator recently bought outright a noted bronze foundry doing a business of $500,000 a year, in order that the work for his house might not be interfered with by other orders. The copper for the bronze work comes from his own United Verde mines, and it is said that he also owns the plant on Long Island at which is being done the marblework and the woodwork,and the quarries in Maine from which comes the granite. The house contains five picture galleries, a circular sculpture hall, with walls and ceiling of white marble, and a faience gallery. There is an observatory—from which may be seen the harbor at the Battery—a courtyard, with a driveway, and a marble fountain by Mr. Philip Martiny. There is also a complete Turkish bath plant, and a well-equipped theatre intended for private entertainments.

In the French chateau on Riverside Drive, West End Avenue, Seventy-third and Seventy-fourth Streets, into which Mr. Charles M. Schwab has just moved, the art gallery takes the whole northeast wing. The house has taken four years to build; it is estimated that the services of 3,000 men were employed in its construction, and the cost, including furnishings, is said to have been $8,000,000. Another sign of the times is that two ready-made homes on Fifth Avenue have recently been sold to millionaires.

Several private galleries have been and are being added to houses. Mr. Benjamin Altman has completed one but Mr. J. Pierpont Morgan's new Italian Renaissance library, at the rear of his home at Madison Avenue and Thirty-sixth Street, is the most important building of this kind. It is in the centre of a large plot on the side street, is 115 feet wide and 73 feet deep, and built of gray Tennessee marble. The design is by Messrs. McKim, Mead & White. While very quiet, it employs much sculptured decoration in the exterior walls and at the entrance. The bronze doors are antiques taken from an Italian palace.

The new Astor Theatre, recently opened, boasts "the finest Greek interior in America." The new $1,000,000 Academy of Music which Brooklyn is to have is another notable play-house in prospect.

The unique New Theatre closes this list, which is lengthening day by day. Endowed by a group of wealthy men, this theatre is already an assured success financially. Arrangements have been made whereby all profits, above a small percentage on the money invested, go back to the theatre for pension and school funds. It is to be one of the most beautiful buildings in New York, and $100,000 is to be spent for paintings and sculptures in the foyer alone. This temple dedicated to histrionic art will doubtless become famous, even in a city that is accustomed to theatrical surprises. If the spirit that led to its building shall dominate its management, the enterprise will be an advance worth while. Thus do beauty and the ideal blossom from out our gross material prosperity.

AN AMERICAN PORTRAIT PAINTER OF THREE HISTORICAL EPOCHS

THE WORKS OF THE LATE EASTMAN JOHNSON, FROM DOLLY MADISON TO JOHN D. ROCKEFELLER—A PORTRAIT RECORD OF THE UNITED STATES FROM THE REVOLUTION TO 1906—REMINISCENCES OF THE WORK AND LIFE OF A DISTINCTIVELY AMERICAN ARTIST

BY

EDGAR FRENCH

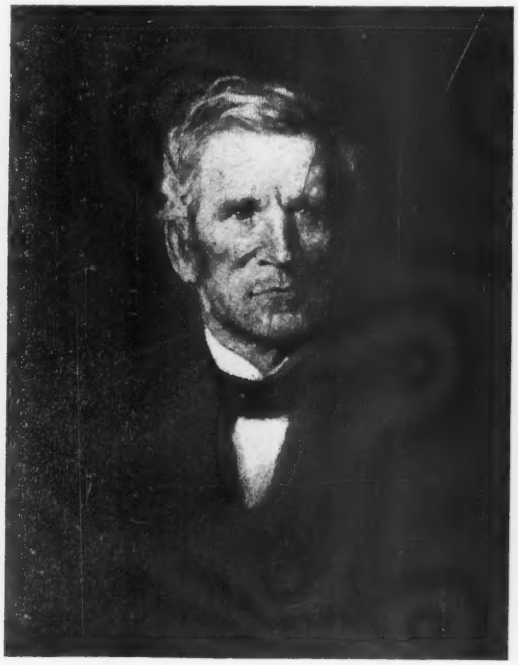
[THE ACCOMPANYING ILLUSTRATIONS ARE USED BY THE COURTESY OF MRS. EASTMAN JOHNSON, AND ARE NOT TO BE REPRODUCED WITHOUT HER EXPRESS PERMISSION]

THE list of portraits painted by the late Eastman Johnson reads like the roll-call of American history. From Mrs. Alexander Hamilton, a belle of the Revolution, to Mr. John D. Rockefeller, the greatest business executive of to-day, there are distinguished names of every generation in it. And Mr. Johnson closed his remarkable career only eight months ago. The portrait record of our national genius that he left behind is one of our most valuable historical possessions—in the length of time it covers, in the versatility of its subjects, and in the sincerity of its artistic expression.

Few men have lived through so many epochs of American history, for Mr. Johnson was nearly eighty-two last spring. Fewer men have had a similarly rich acquaintance among the people who have shaped American history and colored American life. And he alone has left so graphic a record of these acquaintances.

There are interesting authentic stories of Mr. Johnson's boyhood in Maine, such as the one of his first portrait, which he was led to

PRESIDENT THEODORE DWIGHT WOOLSEY OF YALE
Painted by Eastman Johnson



PRESIDENT NOAH PORTER OF YALE
Painted by Eastman Johnson

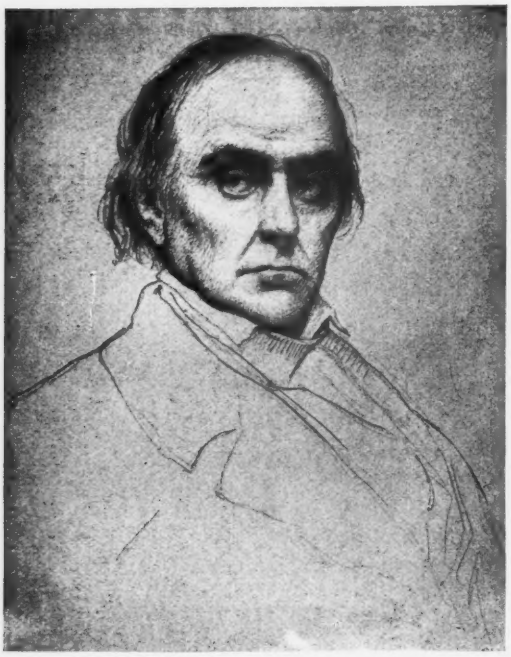
draw by seeing his own face reflected in miniature in a brass button. But the point at which he became a recorder of historical likenesses was after his removal to Washington, D. C., in 1844.

MRS. ALEXANDER HAMILTON
One of Mr. Johnson's earliest portraits

Among the first of these likenesses was the portrait of Dolly Madison, the heroine of the burning of the Capitol in 1813. When Mr. Johnson knew her she was an old lady in the eighties, but a strong friendship grew up between her and the young artist. He wished to have a portrait of her for his own pleasure in its possession, and among the last gracious acts of the old lady's life were the numerous sittings

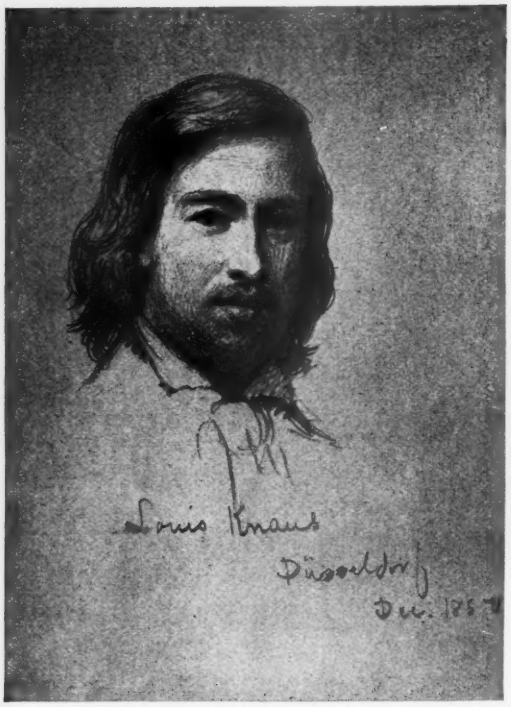
DOLLY MADISON

Drawn from life by Eastman Johnson

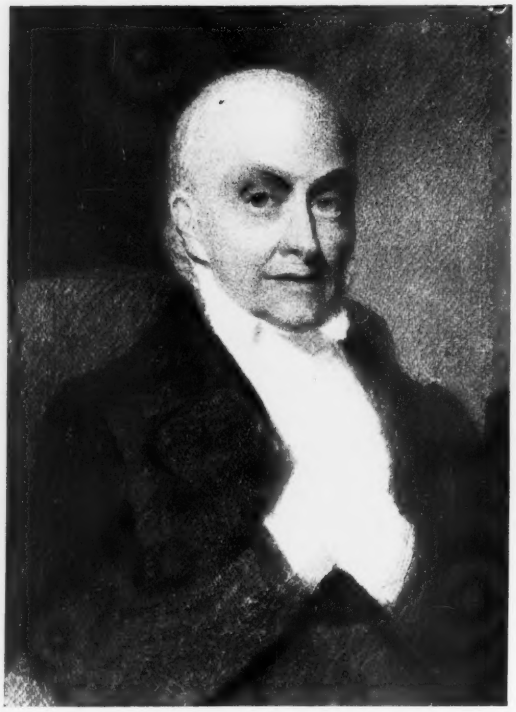


DANIEL WEBSTER
Sketched from life by Eastman Johnson

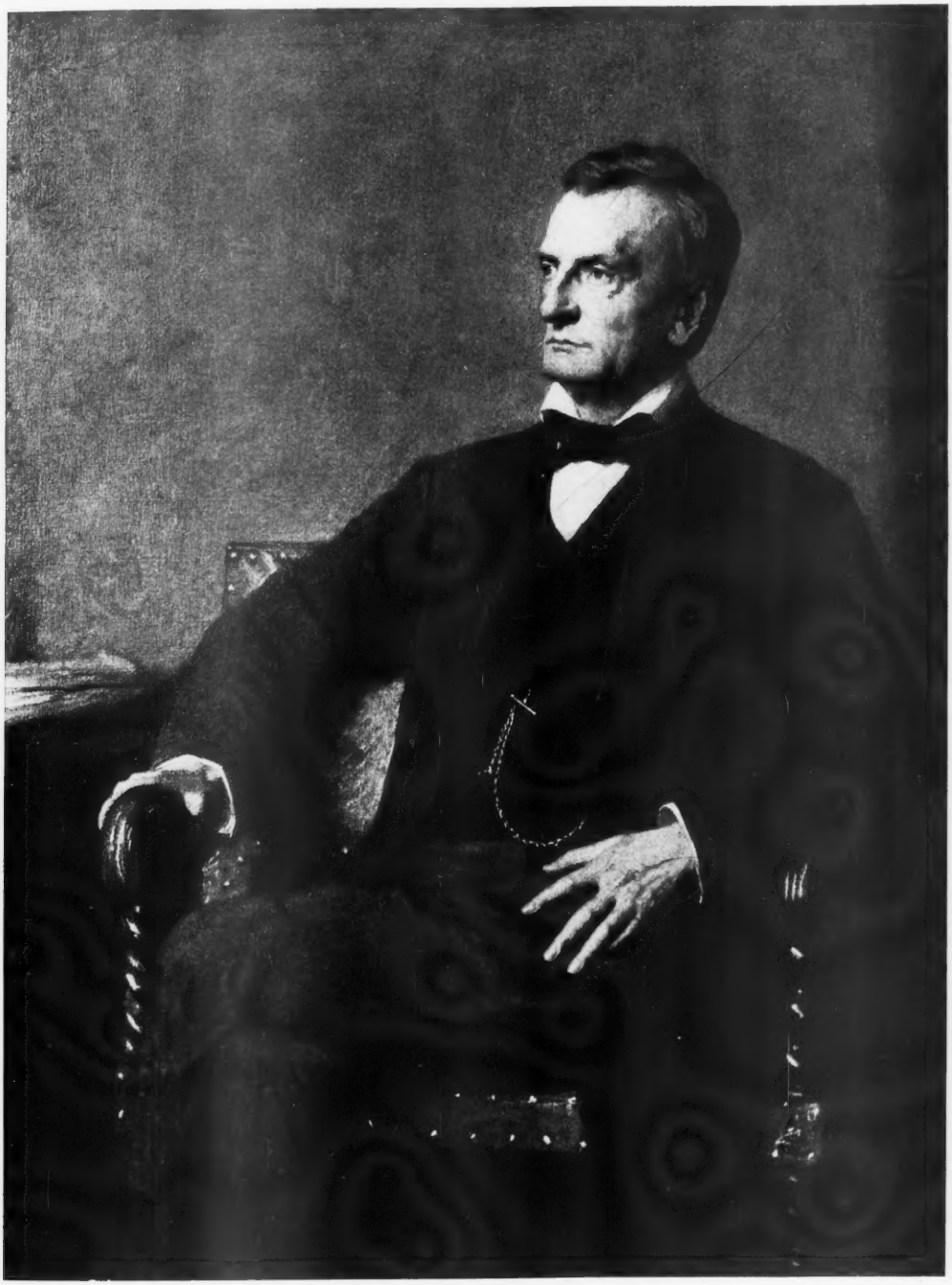
PORTRAIT OF EDWIN BOOTH
By Eastman Johnson



LOUIS KNAUS
Drawn from life by Eastman Johnson

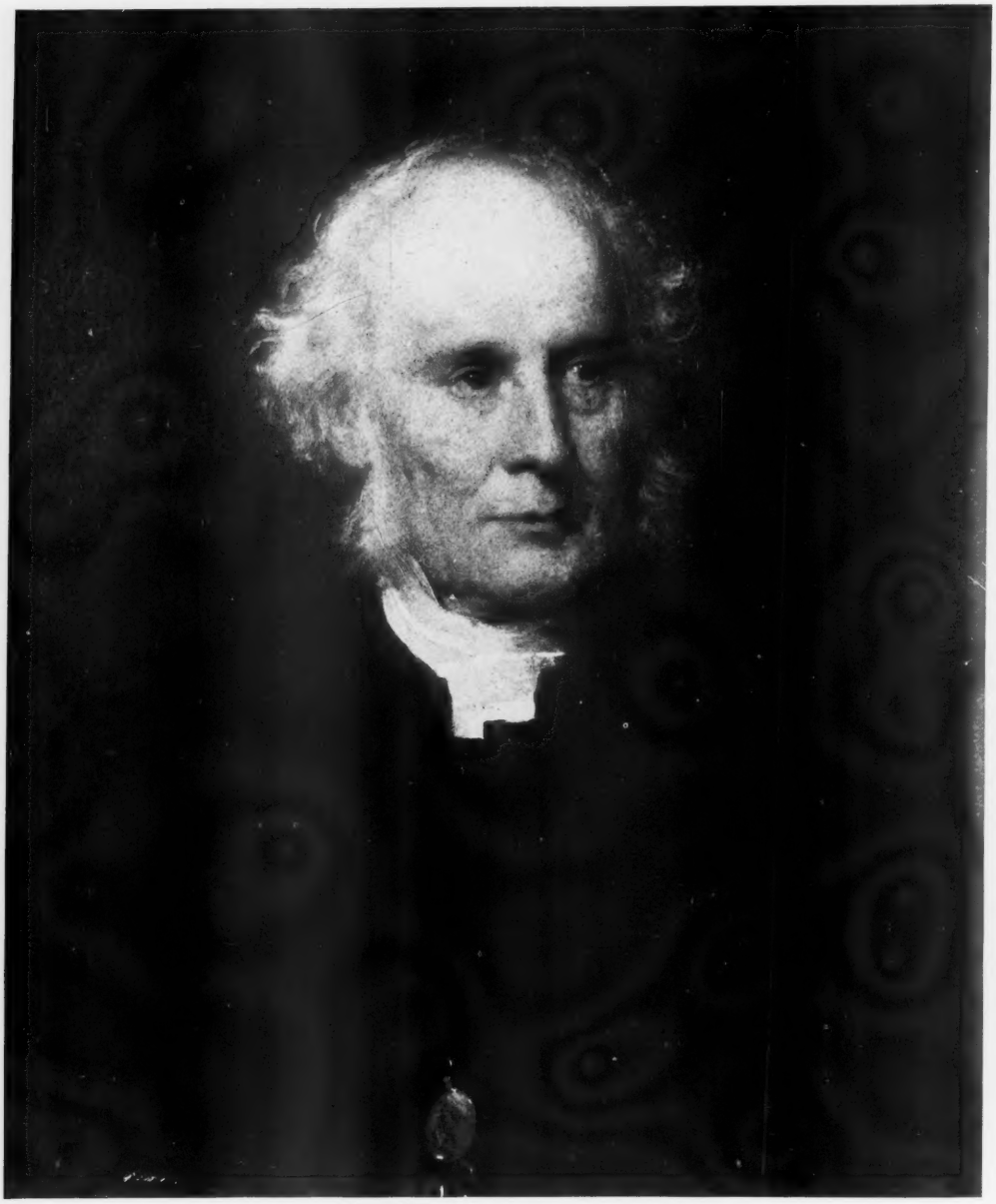


JOHN QUINCY ADAMS
From life by Eastman Johnson



PORTRAIT OF WILLIAM M. EVARTS—BY EASTMAN JOHNSON

which she gave him. On March 16, 1846, he wrote to his father: "On Saturday I commenced a portrait of Mrs. Madison. She is very agreeable, and I take much pleasure in going every morning to her house. She comes in at ten o'clock in full dress for the occasion, and as she has much taste in this matter, she looks quite imposing with her white satin

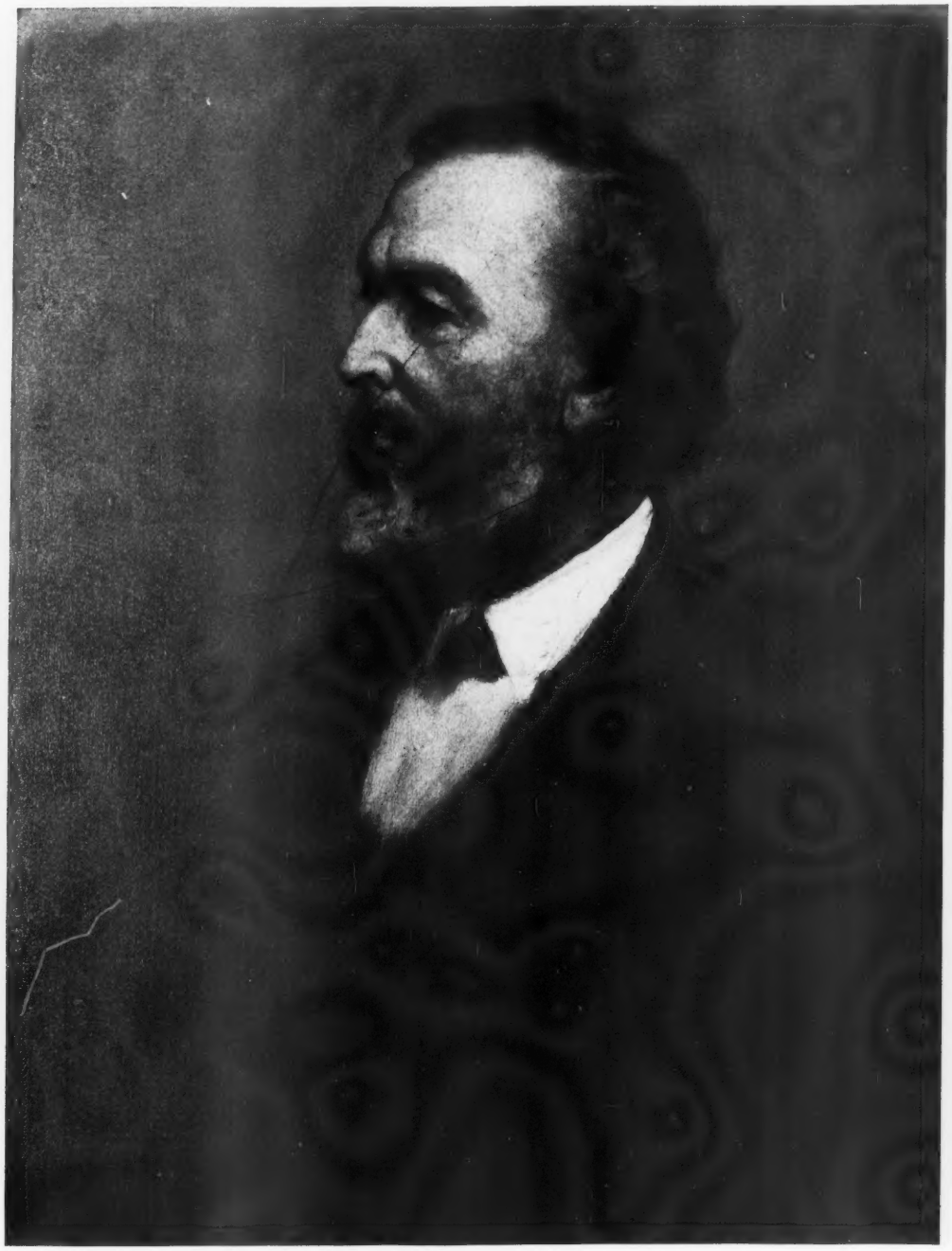


THE REVEREND DOCTOR JAMES McCOSH, PRESIDENT OF PRINCETON UNIVERSITY
Painted by Eastman Johnson

turban and black velvet dress and a countenance so full of benignity and gentleness. She talks a great deal and in such quick, beautiful tones. So polished and elegant are her manners that it is a pleasure to be in her company. I think I shall make a fine portrait. To-day she was telling me of Lafayette, Mr. Jefferson, and others."

The completed portrait is reproduced herewith. It strangely shortens the perspective of our national life to realize that this portrait of one who "was telling me to-day of Lafayette, Mr. Jefferson, and others" is the work of an artist whose last work was done only last spring.

Daniel Webster admired this portrait so

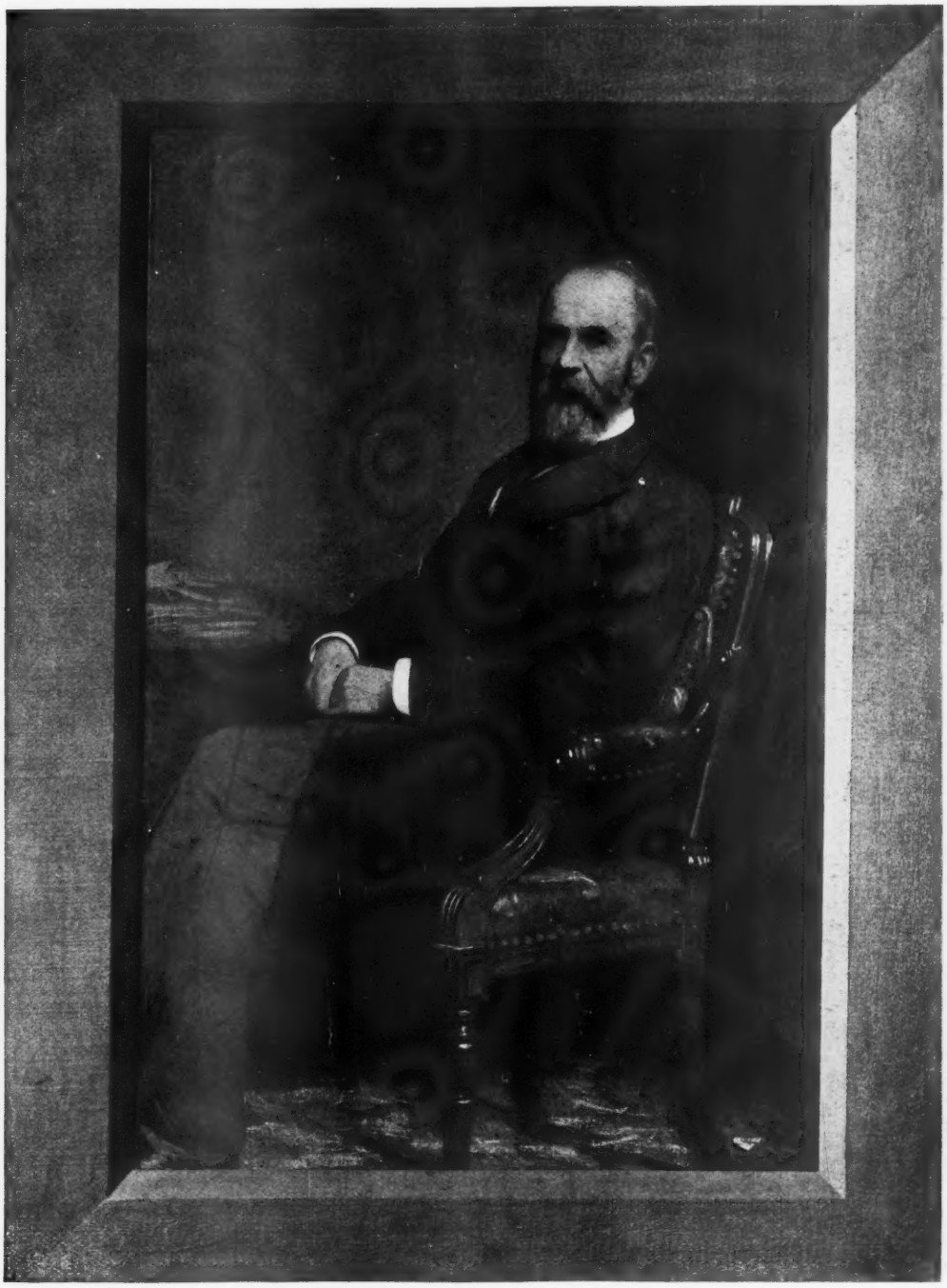


PORTRAIT OF BAYARD TAYLOR—BY EASTMAN JOHNSON

much that he spoke of his desire to own it. But Mr. Johnson prized it too much to part with it, though he afterward made another for Mr. Webster, which was still hanging on the walls of his residence at Marshfield at the time of his death. Mr. Johnson's own copy is still in the possession of his family in New York.

Mr. Johnson's work was then attracting public attention in Washington to such an

PORTRAIT OF JOHN D. ROCKEFELLER—BY EASTMAN JOHNSON



PORTRAIT OF JAY GOULD—BY EASTMAN JOHNSON

extent that a vacant room in a wing of the Capitol was rented to him for a studio. Here he did the likenesses of Senators and Representatives, of Judges of the Supreme Court, and of many other distinguished people. Among these was John Quincy Adams, one of his subjects, whose acquaintanceship linked Mr. Johnson's career with the Revolutionary period.

PORTRAIT OF GENERAL NELSON A. MILES—BY EASTMAN JOHNSON

Thus the same artist who lived to paint the portrait of the twenty-fourth President of the United States, drew from life a portrait of the sixth president. About the same time he made a drawing of Mrs. Alexander Hamilton, another of the Revolutionary characters. She came daily to his studio and the accompanying portrait is the result of those sittings.

After two years in Washington, Mr. Johnson was invited to Boston, in 1847, by Henry W. Longfellow to draw portraits of himself, his wife, and his daughter. These likenesses

A GLIMPSE OF MR. JOHNSON'S STUDIO

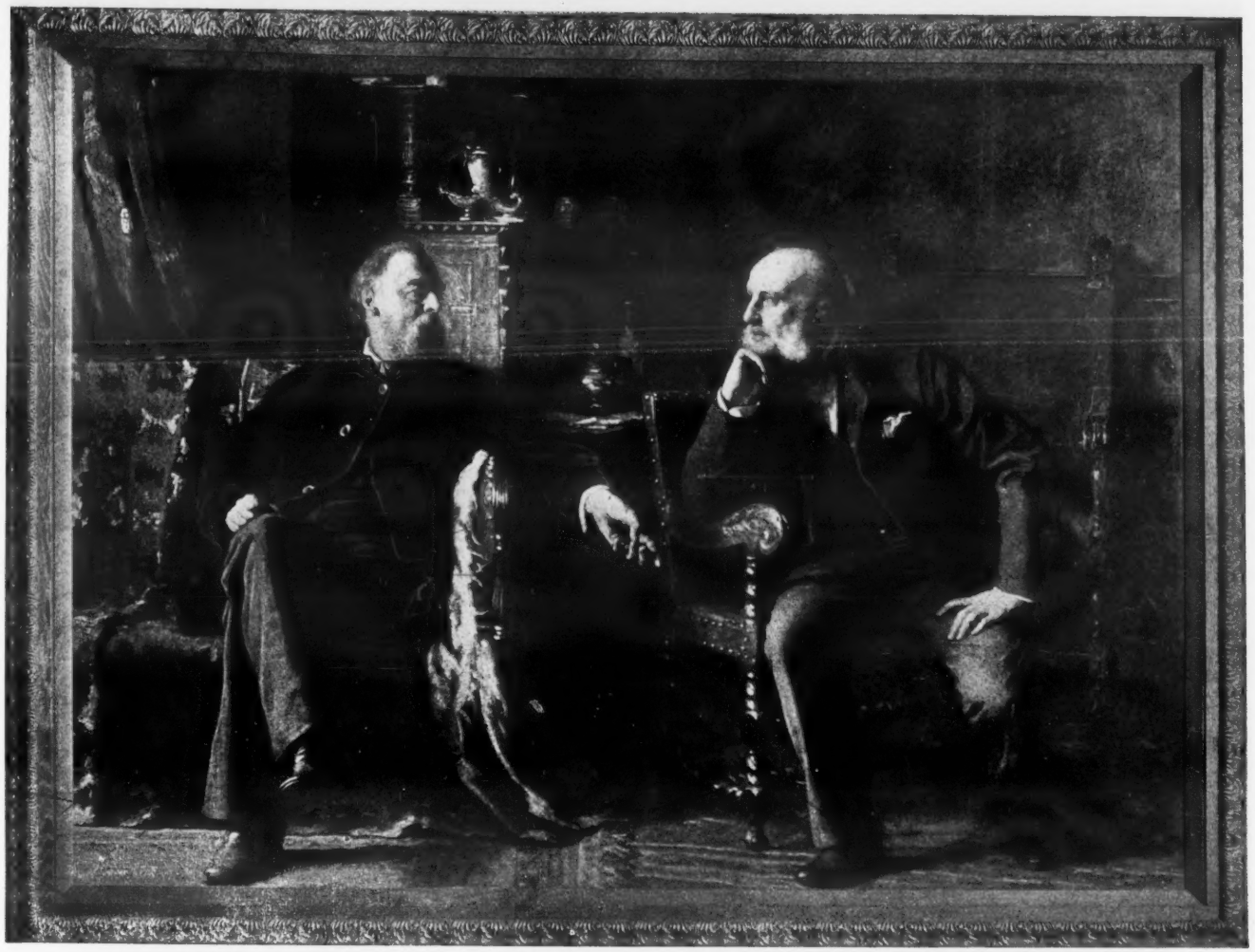
pleased the poet so much that he ordered portraits of several of his friends—Emerson, Hawthorne, Charles Sumner, and President Felton of Harvard. These are still on the walls of Craigie House, the Longfellow mansion in Cambridge. Mr. Johnson took great pleasure in this work of drawing the members of the famous Cambridge literary colony, especially in the study of Emerson. The memory of the days he spent with him was one of his most vivid recollections. Only this year, recalling them, he said of Emerson: "No one ever impressed me so as being a perfectly spiritual man, in mind, in appearance, and manner. His aspect was gentle and lovely, his talk like an angel—oh, every look, every word, every action, was as beautiful as could be conceived. I never met any man like him in that respect. I remember him just as well as if it were a week ago. His beautiful smile—he was a lovely man to be near to. He was a perfect saint—better than that."

Three years ago, when the Society of American Authors gave a banquet in New York to commemorate the Emerson Centennial, this portrait was brought from Cambridge and placed opposite the seat reserved for Mr. Johnson at the speakers' table. Unfortunately his failing health prevented his attendance to link the portrait with the living through the presence of him who had drawn it from life.

While in Washington, Mr. Johnson made the acquaintance of Governor Robert C. Winthrop, an acquaintanceship which led to an order for perhaps his most important historical portrait. Governor Winthrop was a friend of Daniel Webster, and his admiration for Mr. Johnson's portraits made him anxious to have a likeness of Webster from the young artist's pencil. Webster recalled his own pleasure in possessing the drawing of Dolly Madison, and readily agreed to sit at a convenient time. This time did not come until about a year later. King Louis Philippe had sent the American

PORTRAIT OF EASTMAN JOHNSON—BY HIMSELF

PORTRAIT OF MRS. ALFRED R. CONKLING—BY EASTMAN JOHNSON



"TWO MEN" (ROBERT W. RUTHERFORD AND S. W. ROUSE)—BY EASTMAN JOHNSON

MR. JOHNSON PAINTING THE PORTRAIT OF PARKE GODWIN

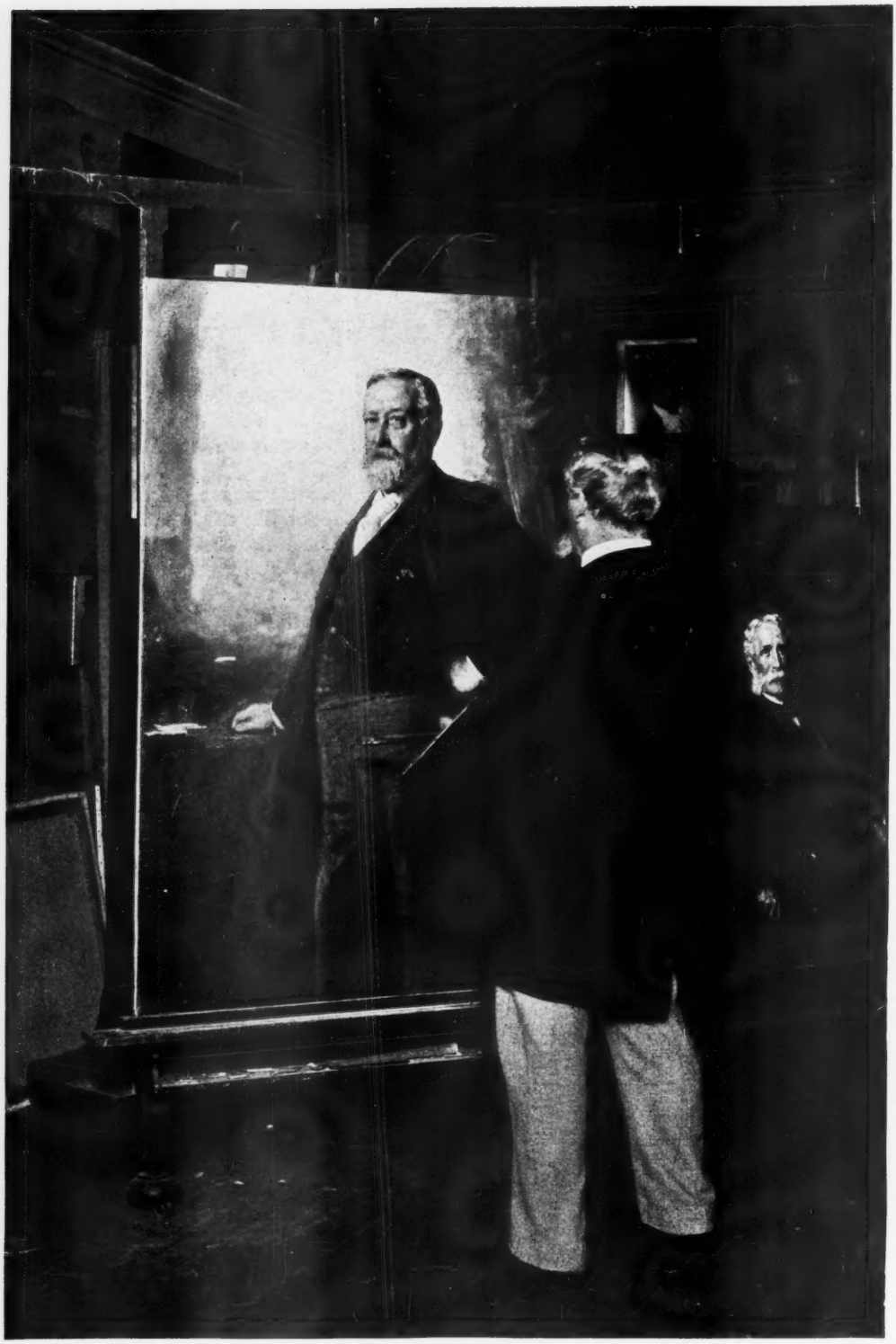
artist, G. P. A. Healey, to the United States to paint the portraits of several distinguished Americans for the palace at Versailles. When Webster agreed to sit for Healey, he recalled his promise to Governor Winthrop, through whom Mr. Johnson was invited to make his sketches at the same sittings.

A room in the basement of the Capitol was therefore turned into a studio, and there Healey set up his easel, while the younger artist moved about the room making his sketches from several points of view. Two complete drawings were made, the first a large one for Governor Winthrop, a photograph of which in 1886 he presented to the Massachusetts Historical Society. The other was the small drawing reproduced herewith for the first time. Once during the sittings Mr. Webster went to sleep and the drawings proceeded during his slumbers. When he was awakened he laughed heartily at the joke on himself, remarking at the same time that there were a great many artists working at once, but that "it is just as well; the more artists the fewer sittings."

And he has left this further record of his impressions of the great orator: "Daniel Webster was a most magnificent man physically, and of very impressive features. His countenance was more impressive than that of any other man. *That* everybody felt. There was no effort or affectation about him; he was utterly unconscious of his great physical impressiveness. He was like a rock or a mountain or a big tree, and his head was the crowning part of his appearance."

In 1849 Mr. Johnson went abroad to study. In Düsseldorf, though a very young man, his reputation was immediately established, and there he made the acquaintance of the artists Louis Knaus and Otto Achenbach. A year and a half later he went to the Hague, and worked in Leutze's studio while that artist was painting the gigantic "Washington Crossing the Delaware." To insure the historical accuracy of the portrait of Washington, Mr. Johnson wrote to his father in America, who had tailors make an exact reproduction of the general's uniform. This uniform was shipped to Leutze, and it was worn by a young artist named Whittridge when he posed for the figure of Washington.

PORTRAIT OF EX-PRESIDENT GROVER CLEVELAND
By Eastman Johnson



MR. JOHNSON PAINTING THE PORTRAIT OF PRESIDENT BENJAMIN HARRISON

Mr. Johnson made a diminished copy of the painting, and had an offer for it from the crown prince of Holland—afterward King William III.—but had to refuse it because the contract for Leutze's original prohibited the sale of copies.

In the Hague Mr. Johnson's reputation was quickly established—he was called "the American Rembrandt." After several years abroad he was recalled from Paris by a death in his family. He spent the remaining years of his life in America, mostly in New York.

One of Mr. Johnson's most interesting portraits was that of Bayard Taylor, made after the poet's death. Taylor had written high praise of Mr. Johnson's "Old Kentucky Home" in his "The Picture of St. John," published in 1866. He wrote:

> ". . . the dusky race you quaintly dress
> In art that gives the finer liberty,—
> Made by your pencil, ere by battle, free!"

Mr. Johnson often spent his summers at Nantucket, where he made the quaint fisherfolk the subjects of many of his *genre* pictures. One such portrait is especially noteworthy. It is of Robert Ratcliffe, an old sailor who had been a common seaman on the British vessel to which Napoleon was transferred from the *Bellerophon* for transport to St. Helena. Ratcliffe recalled two incidents of the voyage. Once Napoleon chucked him under the chin and asked if his superiors treated him well. The other occasion was the subjection of Napoleon to the rites of Neptune while crossing the Equator. The sailors did not dare to take all the usual liberties with him, but they did venture to make him mount a gun carriage, on which he was dragged about the deck.

It would be easy to multiply famous names and anecdotes about them, from the list of Mr. Johnson's portraits, but they would fill the magazine. Even divided into groups they make a great array—artists, authors, soldiers, lawyers, clergymen, college presidents, governors, senators, Presidents of the United States, bankers, business men, financiers, etc.

The "Two Men," often considered his best work—a portrait of Robert W. Rutherford, a brother-in-law of Mrs. Johnson, and S. W. Rouse, the artist—was bought by the Metropolitan Museum of Art. The portrait of his only child, Mrs. Alfred R. Conkling, reproduced herewith, is an excellent example of his later style in feminine portraiture.

Mr. Johnson originated a method of painting portraits that became very popular—the "portrait interior." This method was to paint a family group assembled in their drawing room. The result was a charming effect of domesticity, and adding to the portraits the background of a familiar setting. It is a difficult style to follow, as it adds to the task of drawing likenesses the obstacles of a complicated composition; yet many of Mr. Johnson's most interesting portraits were painted in this manner. One, of the late James A. Burden and family, is an especially good example of a successful use of this style.

But the accompanying engravings must suffice to convey an idea of the variety of his subjects and of the historical periods which they illustrate.

Certain qualities of Mr. Johnson's character make his legacy of portraits peculiarly valuable. These qualities were a rugged independence, perfect sincerity, and a sound patriotism. The first two were illustrated by his attitude toward his sitters. He frequently made several likenesses of one subject, and he was very accommodating about making any changes in pose or arrangement that did not conflict with his artistic conscience. But if a picture did not satisfy him as a faithful, unaffected portrait, he would not let the sitter have it for any consideration. He insisted on his right to be the sole judge of the artistic sincerity and adequacy of his work.

His patriotism was shown more in his *genre* work, for which he is as distinguished as for the portraits. He refused to treat the hackneyed Old-World subjects that many artists believed must be done by a painter who would be recognized. He declared that there was so much beauty all around him in America that he had no time to paint anything else. Consequently all his work is peculiarly American in flavor. The types and scenes are unmistakably of the United States.

His work in American portraiture is, therefore, peculiarly faithful to the spirit of its subjects. He wrought with sincerity and strength to paint the things he saw and loved, and he achieved a worthy success. He did much to fulfil the spirit of the verse which he pasted on the door of his studio many years ago, and which is still there:

> "If you have gentle words and looks
> To share with me, and if you have a tear to shed
> That I have suffered, keep them not, I pray,
> Until I hear not, see not, being dead."

A TEMPLE OF PREVENTIVE MEDICINE

THE ROCKEFELLER INSTITUTE FOR MEDICAL RESEARCH, DEVOTED TO THE SCIENTIFIC STUDY OF INFECTIOUS DISEASES BY ENDOWED INVESTIGATORS —THE FIRST AMERICAN LABORATORY FULLY EQUIPPED TO EXTEND THE METHODS OF PASTEUR—THE NEW ERA IN MEDICINE OF A DEATH-RATE REDUCED BY HALF AND OF THE AVERAGE LIFE PROLONGED BY TWELVE YEARS

BY

FRENCH STROTHER

ONE of the most powerful enemies of death in the United States is the Rockefeller Institute for Medical Research, housed in a massive building high on an East River bluff in New York City. In this building, securely placed for light and air above the city and the river, the battles of science against disease are being fought out by skilful, carefully selected investigators aided by every device of the best laboratories. Scientists there, freed from all financial cares and from all interruptions, are at work with only one responsibility—that of dedicating their best talent and their time wholly to research into the nature of disease, and its prevention and cure.

In 1901, Mr. John D. Rockefeller founded the Institute for the purpose, as he defined it, of accomplishing "the most for humanity and science." Expounded more at length, these words mean that the Institute shall provide, for the first time in the United States, ample facilities for the scientific study of the causes and the course of diseases, and of methods for their prevention and cure. The investigators not only have the use of them free but they are also freed from all other cares, especially of the teaching or of the practice of medicine. In this last provision the Institute is unique. Other American laboratories have more recently been built, but none has an endowment for investigators so that their researches may be secure from every interruption.

When the first endowment was made and the organization of the work begun, the United States was years behind other progressive countries in the scientific study of medicine. England, France, Germany, Russia, even Japan, had laboratories of medical research. In these laboratories had been discovered the specific germs of rabies, of diphtheria, of Asiatic cholera, of bubonic plague, of typhoid fever, and of tuberculosis. And for each of these diseases, excepting tuberculosis, either a specific cure or adequate methods of prevention had been found. The stupendous effect of these discoveries may be realized only by recalling the plagues that periodically devastated Europe, or the cholera plague that swept the United States in the 'fifties. And these discoveries were the fruit of only sixty years of active work in a few European laboratories, whose number, however, was constantly growing. In all this progress the United States had borne no part, except in some private investigations of yellow fever and malaria.

It was for the purpose of supplying this great need that Mr. Rockefeller proposed, in May, 1901, that seven physicians coöperate with him in founding an American Institute to match the Pasteur Institute in Paris, the Koch Institute in Berlin, and the Lister Institute in London. These physicians were Drs. William H. Welch, G. Mitchell Prudden, Christian A. Herter, Theobald Smith, Hermann M. Biggs, Simon Flexner, and L. Emmet Holt. Under their direction, the site at Sixty-sixth Street and East River was bought and the building completed early this year. One of their own number, Dr. Simon Flexner, was chosen to be Director of the Institute.

As long ago as the first century, there were laboratories of investigation in physics and chemistry. But until the nineteenth century, there were no laboratories in which the purely scientific spirit was not confused with some idea of personal profit or of some other unscientific entanglement. But early in the last century, research in many branches of science was undertaken by men whose sole interest was to discover simply what is the truth about

each subject. This spirit grew until, in 1824, Purkinje established a laboratory in Breslau for the study of physiology. Others followed rapidly, as Liebig's, in Giessen, for chemistry; Lord Kelvin's, in Glasgow, for physics; Virchow's, in Berlin, for pathology; Pettenkofer's, in Bavaria, for hygiene; and, in 1886, the Pasteur Institute, for the treatment of rabies and for research into the specific causes of infectious diseases, and of the prevention and cure of such diseases.

Of these laboratories, the Pasteur Institute is the most important to the science of medicine, for it was founded as a result of the greatest revolution ever wrought in medical ideas and practice—the discoveries of Louis Pasteur. The Pasteur Institute is, furthermore, the first of the modern laboratories for medical research, and upon its methods and equipment all later laboratories, such as the Rockefeller, are based.

Before Pasteur, the treatment of infectious diseases, except smallpox, was based more or less upon vague traditional methods, guesswork, superstition, and ignorance. Pasteur's imperishable achievement was the perfecting of a method of research by which such diseases may always be studied with a reasonable hope of learning what causes them and how to deal with such causes.

In general terms, Pasteur's method was to study a disease wholly by experiment and observation. It is hard to realize that almost all medical doctrines sixty years ago were theoretical, and were not the result of observation. Scientists in those days did not go to Nature with an open mind, trying to learn the truth by careful investigation of natural phenomena and by rigorous analysis of their observations. Instead, they advanced theories, about which they reasoned with arguments based on ancient text-books or on supposedly correct general principles. The result was that the science of medicine was a maze of contradictory guesswork and controversy.

Pasteur changed all this. He went to Nature for the proof or disproof of every theory. And he went to her with no idea of proving or disproving any particular theory, but only with the purpose of making every experiment that might possibly throw any light on the subject in hand and of impartially weighing the evidence thus accumulated by his highly-trained observation.

It is profoundly significant, in considering Pasteur's method, to recall that the cure of rabies, which was perhaps his highest achievement in medical science, was the direct, logical outcome of a series of investigations which he began in his youth into the physical structure of tartaric acid. These experiments proved that there were two kinds of tartaric acid, one of which fermented, the other of which did not ferment, under certain conditions. This fact led him to study fermentations generally and long before his discoveries in antirabic vaccines, these tartaric acid experiments, relentlessly pursued, had inevitably led up to the following widely divergent discoveries: the present method of preserving wine against sourness by heating it in the bottle to a temperature of 50° C. to 60° C.; the cause and prevention of a silkworm disease that nearly destroyed the silk industry of Europe in the 'sixties; the nature of splenic fever in hogs, and its prevention; similar successes with chicken cholera and hydrophobia; and a method of preserving beer like that employed for wine.

Early in his work he had made the discovery —and proved its truth—that there are microscopic living bodies floating in the air, which he called germs, and which are the cause of all vegetable fermentations and of all putrefaction of animal tissues. Following this discovery, by patient investigation and experimentation, he observed that in the blood of every person or animal infected with a contagious disease, there are microscopic living bodies, which are now called germs or bacilli. He proved that each of several contagious diseases has its own specific bacillus, which is usually distinguishable from all others, under microscopic examination. By experiments with rabies in dogs, he discovered that these microbes, contained in drops of blood drawn from infected animals, gradually lost their power to harm after several days. Thus a virus two weeks old made from infected blood could be injected into a healthy animal without harm, whereas virus a day old would immediately convey the disease and ultimately cause death.

Further experiments showed that the same healthy animal might be successively inoculated with stronger and stronger (not larger) doses of the virus until a virus less than twenty-four hours old could be used without harm. The animal treated in this way was thereby rendered immune against rabies infection, even from the bite of a "mad dog." A final series of experiments proved that the same treatment,

applied after the bite to the victim, would entirely prevent rabies from developing. This is the present treatment.

Pasteur's discoveries of the existence of germs and microbes, and of their relation to infectious diseases, added to his discoveries that inoculation may be used to prevent other diseases than smallpox, are the basis of all later researches in infectious diseases. Practically all scientists to-day employ this scientific method, which has proved to be the surest way of getting at practical scientific truth. This method consists in the impartial analysis of observations made in innumerable experiments, with every element considered which might conceivably affect the final judgment.

And the relation of the Rockefeller Institute to the science of medicine is the same as Pasteur's—for the Rockefeller Institute is simply the best-endowed, best-equipped, and best-organized of the recent foundations for carrying on Pasteur's work and methods.

The organization of the Institute is into departments, each under a scientist of established reputation. The researches in experimental pathology are under the direction of Dr. Flexner and Dr. E. L. Opie; in chemistry, under Dr. P. A. Levene; and in physiology under Dr. S. J. Meltzer. Each of these heads of departments has an assistant, or assistants, and both chiefs and assistants are engaged in actual experimental research work in addition to their executive duties. Besides this permanent staff, provision is made for resident fellows and scholars, who are endowed for limited periods during which they work out problems under the supervision of the staff. Then there are facilities for a few doctors and surgeons to make original investigations with the aid of the laboratory's appliances. To spread the benefits of the Institute still further, the trustees grant small sums yearly to non-resident scientists whose investigations they are convinced it may be wise to further. About twenty of these grants have been made every year, and they have been used in ways so various as helping to send a Harvard scientist to the Philippines to study smallpox, and coöperating with the Health Department of New York to secure a better milk supply for the city.

In the laboratory itself, a great many important investigations have been and are being carried on. The results of these labors are published in the Institute's own organ, the *Journal of Experimental Medicine*. These researches include discoveries concerning dysentery, diarrhœa, diabetes, snake venom, smallpox, and milk. More important researches than these are now under way; but even the subjects of such investigations are not made public until some results have passed beyond the experimental stage.

The facilities that are provided for these researches are sufficient for about fifty workers. They include fully equipped laboratories of chemistry, bacteriology, physiology, and pathology. On every floor on which there is a laboratory there is also a cold-storage room, with chests at three temperatures. These chests are used for storing bacteria "cultures" during the progress of experiments. There is a complete equipment for making photographs of microscopic objects. An automatic telephone connects every important division of the building with every other. Its library contains now 3,000 bound volumes.

The building itself is of fireproof construction throughout, and every corner of it is light and airy. Surely here is a wonderful measure of the progress in public appreciation of scientific research, when one recalls that Pasteur died but eleven years ago, and that he and his fellow students carried on their first revolutionary experiments in foul, dark cellars that one of them called "the tombs of scientists."

It is intended to utilize some day part of the ample grounds around the laboratory to build a hospital, in which cases of the infectious diseases under study will be received, so that there may be constantly at hand the human patient afflicted with whatever disease is being investigated.

The Institute has now been organized a few months more than five years. It has had its permanent home only since May 11th of this year. And yet it has accomplished much already—a suggestion of how much is given above. These accomplishments are only the first fruits of its work. When it shall have its full staff of fifty trained investigators at work, it will be fair to expect greater things. But as it stands, it is a mighty monument to the new era in scientific medicine—an era which has already reduced the death-rate by one-half and advanced the expectation of life by twelve years—an era which has seen an incalculable service done mankind in the relief of suffering, and which is daily making less potent the powers of death and more secure and useful the life of every individual of the race.

PRACTICALLY CIVIL WAR IN RUSSIA

THE PEOPLE AGAINST THE GOVERNMENT, AND BOTH SIDES USE VIOLENCE —THE GOVERNMENT'S "POLICY OF REPRESSION" AS INTERPRETED BY MILITARY GOVERNORS—THE BANDS OF "BLACK RAVENS" THAT ROB IN BROAD DAYLIGHT—THE WHOLE EMPIRE A RUMBLING VOLCANO—A CRITICAL ANALYSIS OF THE FIRST DUMA AND A FORECAST OF THE NEXT

BY

ISAAC A. HOURWICH

(SPECIAL WRITER FOR "THE WORLD'S WORK" IN RUSSIA)

FROM the Baltic to the Black Sea, and wherever the flag of Russia flies, the commandment "Thou shalt not kill!" has been suspended. Aside from summary executions by military governors, the columns of the daily press are filled with reports of citizens beaten, maimed, and killed—by the police, by the Cossacks, and by plain "Hooligans" affiliated with some "patriotic" society. The reign of terror is supreme.

Take, for example, a case that happened in the very capital of the Empire, under the eyes of newspaper correspondents from all parts of the world, and which has been variously reported.

A regiment of the Empress's Cavalry Guards were riding along Sergius Street, singing a military song. A working-girl on the sidewalk remarked contemptuously that they looked as if they had just taken Port Arthur. Some bystanders caught up the words and shouted: "Hurrah for the Port Arthur boys!"

An officer of the Guards, riding near the sidewalk, had heard the girl's remark. He ordered six of his troopers to seize her. The girl ran and hid in the hallway of an apartment house, but was dragged forth and carried in a cab to the guard-house.

"Take her and do what you please," said the officer.

The men unanimously declined.

The officer then called seven troopers known as "the executioners" and commanded them to give the girl twenty-five blows with their whips. She was then allowed to stagger away.

Though the affair was reported in all the newspapers and the identity of the officer was well known, he has not been called to account. And at the present writing, a month has already elapsed.

This incident has been widely reported because of its "news interest." Scores of similar outrages are occurring in all parts of the Empire daily, but are never heard of.

Russia is in a state of revolution. This fact has been officially proclaimed by the Government in justification of its policy of repression, the like of which has not been witnessed since the days of Ivan the Terrible.

WHAT "THE POLICY OF REPRESSION" MEANS

All the promises made by the Czar on October 30, 1905, in the face of a general strike which tied up all the railroads and involved millions of people of all conditions, were truthfully characterized by Assistant Minister of the Interior Makaroff, on the floor of the late Duma, as "generalities without any practical meaning."

Since the dissolution of the Duma no public meetings of any kind are permitted anywhere in the Empire. In the Capital, all Constitutional Democratic clubs have been closed by the police; all labor unions and many of the professional associations have shared the same fate. The Constitutional Democratic party has been denied permission to hold a national convention. Newspapers and magazines have been suppressed by the score, and their editors indicted. Publishing firms, printing houses, and book stores have been closed and their stocks of books confiscated.

The prisons are filled with men and women in all walks of life, from peasant to priest and noble. According to a published official statement for the nine months ending August 23d, 10,554 persons were deported without trial by order of the central government; of these, 2,349 to Siberia. This number does not include those who were deported by local military governors-general.

When the doors of the Duma were shut against the representatives of the people, their desks were in their absence searched by the police and all their correspondence was seized in disregard of the immunity assured to them by the law. And now the elders of the townships by which resolutions were passed endorsing the policy of the Duma are being everywhere prosecuted by the Administration "for misusing their seal of office." The ex-members of the Duma are harassed in every way, to prevent them from addressing their constituencies.

For example, in the town of Kamyshin, province of Saratof, the police attempted to arrest ex-Representative Dietz. "Take me, if you will," he said quietly, "but you will have to take the consequences." The house was quickly surrounded by thousands of determined citizens and there was nothing for the police to do but to retire. At Uralsk an armed force had to be used by the Administration to disperse a peaceable meeting addressed by ex-Representative Niedonoskoff, who was wounded and taken prisoner. Several others have been arrested in their homes under the cover of night for discussing the work of the Duma at public meetings.

Martial law was in force, on September 12th, in sixty-four out of the eighty-seven provinces of the Empire. The governors are everywhere invested with the power to commit any offender for trial by a court-martial pursuant to the law obtaining in a besieged fortress. At Tiflis the military governor-general has issued an order that the owner of any apartment house in which a terrorist may be discovered shall be fined and deported by executive order, without trial.

All this having been found insufficient to cope with the revolution, a ukase of the Czar made public September 5th created field courts-martial, which have jurisdiction of all criminal cases "where the guilt is evident"—presumably, evident to the army officers composing the court. The trial must commence within twenty-four hours after the commission of the crime and sentence must be pronounced within two days from the beginning of the trial; there is no appeal from the sentence. The execution of the prisoner, if condemned to death, must take place within twenty-four hours after sentence has been pronounced. The offenses which are cognizable by these extraordinary tribunals are not specified in the act, the matter being left to the discretion of the military governors. The mode of procedure is not without precedent, having been tried in the vicinity of Moscow after the insurrection of last December, in the Baltic provinces, in the Caucasus, on the Siberian Railroad. Thousands of men, women, and even children were executed on mere suspicion.

A characteristic case is that of Medvednikoff, a civil engineer employed at Tchita, on the Transbaikalian Railroad. He was arrested, tried, sentenced, and hanged within twenty-four hours, because a police officer testified at the trial that the prisoner knew where arms were secreted by the revolutionists—notwithstanding the fact that no armed uprising had even been attempted.

Another example is the case of four newspaper men of Verkhneoodinsk, Eastern Siberia, who are now in a penitentiary for having published what was, in the judgment of a field court-martial, a "seditious" article. Their guilt was "evident," notwithstanding the fact that there had been no insurrection anywhere within the field of circulation of that newspaper. They were first sentenced to death and it was only upon the strongest representations to Count Witte from all the newspapers of the Empire that the sentences were commuted to long terms of imprisonment at hard labor. The paper was the Constitutional Democratic organ.

According to latest advices from the Baltic provinces, a number of political cases which were recently tried before regular courts-martial, in the absence of the defendants, were either dismissed or resulted in sentences of short-term imprisonment. The cause of the default of the defendants was that they had been executed last spring by precisely such field courts-martial as those with which all Russia has now been covered.

The object of these drastic measures is "pacification." As soon as peace is restored, the Government promises to turn its attention to reforms. It is obvious from all the acts of M. Stolypin's cabinet that the "pacification" aimed at means silent submission to the autocratic rule of the all-powerful Bureaucracy.

"REPRESSION" FAILS TO REPRESS

The Duma was dissolved because it was fomenting a revolutionary spirit among the people. The St. Petersburg daily *Perelom* is authority for the following figures, which show

the effect of the avowed policy of repression on the activity of the revolutionary terrorists.

The news of the dissolution of the Duma reached the country on July 10th, according to the Russian calendar. During the first half of July, sixty-five government officials were killed and sixty-six wounded, besides twelve attempts which failed. During the first half of August, however, 179 officials were killed, 255 were wounded, and twenty-six attempts failed. Thus, assaults upon officers of the Government grew more than thrice as frequent after the dissolution of the Duma.

The strain is visibly telling on the agents of the Administration. Immediately after the assassination of General Mien, commander of the Semionoff Regiment of Life Guards which earned the gratitude of the Czar by their service in the pacification of Moscow, Colonel Riemann of the same regiment left his house in the neighborhood unnoticed by the members of his household and has not been seen since. From many quarters an epidemic of resignations by public officers has been reported to the Minister of the Interior. There is a notable scarcity of applications for the vacancies. The press has likewise commented upon the unusual number of resignations lately tendered by governors, assigning ill-health as the cause.

The Government is straining every effort to stop the circulation of the appeal addressed to the citizens by the ex-members of the Duma who immediately after its dissolution reassembled at Viborg and urged upon the people the motto of passive resistance to the Government: "No taxation, no recruits, without representation."

A few St. Petersburg newspapers which published that document were promptly suppressed by the Minister of the Interior and all copies which the police were able to lay their hands on were seized. Thereupon the Socialist organizations undertook the task of printing and circulating the appeal. At the Capitol, where the main forces of the police are concentrated, a conveniently located printing shop was selected; a group of armed men, some of them printers by trade, invaded the shop at a late hour in the night, arrested every person within, and proceeded to set up and print the appeal. When the work was done, they quietly left the shop and carried with them the stock of printed copies. The same method was repeated in several other cities. In no case was any one arrested, in spite of all precautionary measures adopted by the police.

Failing to discover the offenders, the Government turned upon the proprietors of the shops, accusing them of connivance with the conspirators; their shops were closed by the police, without the formality of a trial. Still millions of copies of the Viborg appeal were openly circulated among the people. I was myself offered a copy in a trolley car at Moscow, though every policeman around was carrying a rifle.

Unable to stem the rising revolutionary tide, the repressive policy of the Government has fostered the growth of that species of anarchism which is making the property of private citizens unsafe in Russia.

After the failure of the local uprisings in December, 1905, the jails were packed with political prisoners, "punitive expeditions" were shooting and hanging suspects by the score without trial, and hundreds were hiding to escape court-martial that meant certain death. The demands upon the treasuries of the revolutionary organizations soon exhausted their resources. The moneyed classes, intimidated by the wholesale persecution of all sympathizers with the revolution, were shy of financing revolutionary committees. Imagine the despair of the friends of a doomed man who could be saved from the gallows by a hundred dollars, when that small sum could not be had. The temptation is very strong, in such a case, to force contributions from unwilling men of wealth by producing the revolver or the bomb primarily intended for the agent of the Government. A convenient theory was furnished by the so-called "revolutionary" socialism and anarchism to justify such offenses against private property. This crude conception of socialism has been repudiated by the Revolutionary Socialist party, by the Social Democratic Labor party, and by the Bund at their recent conventions, but the authority of these organizations is not recognized by the anarchistic and semi-anarchistic groups.

Thus it was that an epidemic of bold robberies broke out in all sections of the Empire. Some of the groups which had specialized on "expropriation" for political purposes soon degenerated into gangs of common robbers. The general depression of business resulting from the disturbed state of the country has thrown large numbers of workmen out

of employment. Many a man who had fought in the ranks of the revolutionists has joined some band of "Black Ravens," who practice individual "expropriation" for their personal benefit. According to the statistics collated by *Perelom*, 164 robberies of this kind were reported during the first half of the month of August, an average of eleven a day; of these only 23 were unsuccessful. The main field of operation of the anarchists and the "Black Ravens" is Odessa, which has for nearly a year been under martial law.

The question may well be asked: What has the Administration accomplished, with all its extraordinary powers, for the protection of the property of the citizen against robbery in broad daylight?

POLICE IN LEAGUE WITH ROBBERS

It has been established in some cases that the police were themselves in league with the robbers. To cite one example, at Warsaw a police detective, one Rachkovsky, was arrested as a leader of a gang of robbers who called themselves anarchists.

I have discussed this subject at Odessa with many competent observers, one of whom is a reputable attorney who had acted as counsel in many of the anarchist or quasi-anarchist trials. It is the common belief at Odessa that in the beginning the police shared the booty with the robbers. It is customary with the anarchist committees to give notice to their victims, a few days in advance, that on a stated day and hour a representative of theirs will call for a specified sum of money. The police, whenever informed by the party marked for extortion, invariably arrive too late. The banking house of Hayman & Company on Gavannaya Street, in the heart of the city, was thus "expropriated" of six hundred dollars, while a policeman was standing in front of the office. When the complaints of the public grew too loud, a few arrests were made, but the friends of the prisoners revenged themselves upon the complainants by throwing bombs into their stores. While I was in Odessa, there were two cases of this kind.

It is, of course, impossible for the private citizen to fight single-handed a gang of armed desperadoes. But the Imperial Police Department, under M. Stolypin, by a circular dated August 7, 1906, confirmed the order issued by Minister von Plehwe, whereby all associations of private citizens for self-defence must be broken up, since the prevention of robberies is the duty of the police. Six days later the governor-general of Odessa issued a circular to the public, wherein he severely censured those who submit to the extortion instead of defending their property with arms in hand, as they are permitted to do by law. The following is quoted verbatim from that circular: "All persons failing to report immediately to the police the receipt of threatening messages, or those who from cowardice enter into deals of any sort with the wrongdoers, will be punished by executive order to the fullest extent of the law, as accomplices."

Thus, according to the latest bureaucratic dictum, the robber can have his victim for his accomplice. The military government may fail to catch the robber, but the victim of the robbery, if found out, will no longer escape the penalty of the law for such cases made and provided.

STRIKES AND THE MAILED FIST

The strike has become in Russia the favorite method of political warfare. The dissolution of the Duma was answered by a strike of 90,000 factory operatives at St. Petersburg and 50,000 at Moscow. It was expected that the strike would assume national dimensions, as in October, 1905, and would force the Government to rescind its order. The plan failed, but at some Moscow factories the opportunity was made use of by the operatives to submit a list of grievances to their employers. The governor-general of Moscow ordered all obdurate strikers deported without trial. The employers endeavored to intercede in behalf of their striking employees, representing to the governor that by his order they would be deprived of the services of experienced men, whereas they felt confident that their differences with the strikers could be adjusted without outside interference. But the governor would not modify his order. Moreover, at some establishments the strike was on the point of settlement when the governor-general objected on the ground that the demands of the strikers included the payment of full wages for the time lost during the strike. While the employers were disposed to grant this demand, the governor-general refused to permit such an encouragement to future strikes.

Naturally, this bureaucratic meddling with private business has aroused antagonism among the employers, as well as further alienated the

workmen. The governor-general of Odessa seconded his Moscow colleague by the following order:

"The proprietors of all establishments where the workmen have struck for any reason, in the event of their paying the strikers for the time of the strike, will be punished to the fullest extent, including the closing of their establishments."

PUBLIC OPINION REFLECTED IN THE DUMA

Under the Russian election law, the rural classes are most favored. All land-owners and their managers, all lessees of large estates, and (with certain exceptions) the bulk of peasant householders are entitled to vote. The number of voters in urban settlements is estimated by Lositsky, a Russian statistician, as follows:

Owners of city real estate	870,000
Tradesmen and manufacturers	830,000
Managers and clerks in commercial and industrial establishments	230,000
Government and municipal employees	450,000
Householders not enumerated above	330,000
Workmen in factories	2,360.000
Total voters	5,070,000

Thus, the majority of city voters are property owners, business men, government employees, and professional men. These voters choose a certain number of electors, so proportioned as to ensure a further preponderance of the more substantial elements in the electoral college.

Factory employees—grouped into a class by themselves—choose throughout the Empire 236 electors, as against 3,455 electors chosen by the rest of the city voters enumerated above. The peasantry choose 2,726 electors, while 2,231 represent other landed interests. So the representatives of property and business control 5,686 votes in the electoral college, as against 2,962 representing the peasantry and the factory workmen. The ratio of representation for each class is about as follows:

Rural property	1 elector to 2,000 population
City property and business	1 elector to 4,000 population
Peasantry	1 elector to 30,000 population
Factory laborers	1 elector to 90,000 population

Judged by American standards, the Russian electoral college stands for the conservative elements of the Empire.

It has been charged in an Imperial ukase that the Duma was revolutionary. If so, then revolt permeates every class throughout the Empire, for the Government's efforts to control it were as unscrupulous as those of a lawyer bent on having a "packed" jury. It was a foregone conclusion that an assembly chosen by such limited suffrage, under pressure never before witnessed in the history of representative government, would be "a policeman's Duma," as the poet Balmont expressed it to me while I was in Paris.

Martial law was in force all over the Empire before the election. Public meetings were permitted only to the conservatives. The Constitutional Democratic meetings were held only under the greatest difficulties. Such of its leaders as were considered logical candidates were indicted on trumped-up charges and thereby disqualified. Popular lawyers, college professors, editors, physicians, and other influential members of the Constitutional Democratic party were imprisoned and in many cases deported by executive order. The frauds perpetrated in the registration of voters would have qualified the election officers for membership in the Philadelphia "machine" in the days of its absolute power.

And yet, when the Duma assembled, scarcely a baker's dozen was favorable to the Government and all votes on important questions were well-nigh unanimous. The Bureaucracy now raises the cry that the Duma was not representative of the will of the people. But since the electoral system originated with the Bureaucracy, it has only itself to blame. It is well worth knowing, however, just who were the voters and who were the representatives in the Duma.

Now what of the men selected by these voters to represent them in the first Duma?

In the first place, it was not an assembly of boys. More than half of the members were above forty; two-fifths were between thirty and forty; and only 34 out of 448 were younger than thirty. So three-fourths were in the prime of life.

As to education, two-fifths were university graduates and another fifth was made up of high school graduates. Thus, the majority of the Duma would rank in America or England as men of more than average culture.

By occupation, one-fourth of the members were farmers and another fourth represented property and business. The labor represent-

atives did not exceed 5 per cent., and the remainder were professional men.

By nationality, three-fifths belonged to the dominant race. As to religion, three-fourths affiliated with the Orthodox Church.

From these facts, it can be plainly seen that the Duma did fairly represent the voters.

THE COMPLEXION OF THE NEXT DUMA

The Government has publicly promised that another election will be held in time for a new Duma to assemble in March. Meanwhile, what changes in public sentiment have taken place, and in which direction?

The organs of the Government "point with pride" to the results of the zemstvo elections held since the dissolution of the Duma. Two years ago the zemstvos were outspoken for constitutional reform; this year the Constitutional Democratic candidates were defeated by the leaders of the reactionary nobility. The explanation is found in the stand taken by the Duma on the land question, which alienated from the Constitutional Democratic party the sympathy of the landed nobility, which controls about 90 per cent. of the membership of the zemstvos.

In the coming Duma election, however, this change can affect only two provincial electoral colleges, where the nobility controls a majority of the votes. In the fifty-nine others in European Russia, the Government must enlist the city voters in order to win. But there are no indications that the city voters love the Bureaucracy more than they did before. On the contrary, the Duma has been a lesson to those who stayed away from the polls at the first election because they feared the Government would secure by fraud and force an assembly of pliant tools. There will be no boycott of the polls at the next election.

As a consequence, the opponents of the Government will be reinforced by the large body of radicals who refused to vote at the first election—and by many a popular leader who declined to be a candidate for the first Duma. This view is borne out by the majority of the reports of the governors to the President of the Cabinet on the state of public opinion since the dissolution of the Duma. For this reason, a faction of the "Star Chamber" at Peterhof—led by M. Pobiedonost—is in favor of postponing the election indefinitely.

In this connection, the attitude of the peasantry is full of significance. The Government has issued a call for the election of local joint commissions—to be composed of owners of large estates and peasants—to settle the land question. But in nearly all the districts the peasants have passed resolutions to the effect that, inasmuch as their representatives to the Duma were chosen to settle this question and others, they decline to elect delegates to bureaucratic commissions. According to Prokopovitch, a Russian economist, strikes of tenants and farm workers over 174 counties may be expected in the spring.

Among this class, the Viborg appeal of the ex-members of the Duma is being widely circulated. Whether in response to this appeal, or independently, the peasants in many districts are refusing to pay taxes. In some townships, such refusal was followed by levies upon the personal property of the delinquents. Some curious things happened. On the day set for the public sale, the entire community turned out to witness the proceedings—but there was not a single bidder and the property remained with the owner! One military governor-general has issued a proclamation threatening every delinquent tax-payer with court-martial; but if this passive resistance become general, it will be impossible for even the most determined officer to court-martial the entire farming population of his district.

Should the Viborg appeal meet with a general response on the part of the peasantry, conflicts in every village are inevitable. Judging from the present spirit of the military governors, this means that the Siedlec horrors will be repeated on a national scale. In any event, only a short-sighted Bureaucrat can see victory for the Government in the next Duma election.

After deducting from the population of the Empire the ex-members of the Duma, newspaper publishers, editors, printers, and their employees, political prisoners with their fathers, brothers, and sons, terrorists and their landlords, anarchists and bankers robbed by them, revolutionists and incorrigible Constitutional Democrats, strikers and their employers, members of labor unions and professional societies, village elders who believed in the Duma and said so—there remain the "good citizens" to whom the Government appeals.

But so long as every man in uniform, from department chief to patrolman, is invested with autocratic power over the citizen—good and bad alike—just so long will the appeal fall on deaf ears.

EXPERIMENTS IN PUBLIC OWNERSHIP

The cure-all proposed by Mr. Bryan for the ills of corporate railroad management is that the Government own and operate the great trunk lines while the individual states control the lesser lines within their borders. The articles below, by Mr. Womack and Mr. Keys, show the dismal failures in North Carolina, Missouri, Pennsylvania, and elsewhere, of experiments in the state ownership of railroads.

STATE OWNERSHIP IN NORTH CAROLINA

AN EXPERIMENT WITH PLANK ROADS IN COUNTRY DISTRICTS AND RAILROADS FROM MOUNTAINS TO SEA—HOW THE HUNGRY POLITICIAN BROUGHT ABOUT THE AWAKENING

BY

T. B. WOMACK

FORMERLY JUDGE OF THE SUPERIOR COURT OF NORTH CAROLINA

DURING the second quarter of the nineteenth century a great furor for internal improvements overran the state of North Carolina. Governor John M. Morehead was one of its leaders. Many of the schemes suggested were as wild as populism would desire, while others had sufficient good in them to add to the fame of those who brought them to light. The beneficent results to be attained by each were painted with all the glitter of a modern promoter's prospectus. There was one notable difference however. Graft was unknown. Personal ambition was subordinated to public weal. Patriotism, prosperity, progress, and state pride, were the cabalistic charms. Ability and experience were joined. The efforts were not spasmodic but extended over long periods of time and through varying conditions.

First a system of plank roads was devised and put into practical operation. The longest ran from the present city of Winston-Salem to Fayetteville, the head of navigation on the Cape Fear River. Many others were projected from the head of navigation on the various streams to cover the entire state, bring all points nearer to deep water, and build up great North Carolina seaports.

I remember well the delightful sensation of a drive behind a good trotter over a large portion of this highway. Pleasant was the hum of the wheels in the half-inch of sand that covered the plank. There was no hill to break the trot, not a stump to fret the steed or jar the driver, not a rut to drop into, not a mud-hole to soil the polished vehicle or bespatter the well-groomed horse. No grade was too steep for the well-filled "schooner" wagon, for the manufacture of which Salem and Waughtown, on the line of the highway, were famed. Was there ever such perfection in a country highway? The roadway was built of three-inch "heart" pine, laid loose on heart-pine girders. A ditch on each side drained the highway and furnished sand for the ends of the plank to hold it in place. The sand gradually worked into the roadway, making a pleasant cushion for the feet of the horses, and giving a resiliency to the highway approximating the modern comfort of rubber tires.

A few years later, I traveled the road again. The plank had begun to decay. Frequent holes kept one always on the alert. Deep furrows, leading away from the plank road and back to it again at convenient distances from each toll-house, told but too plainly that the drivers had learned how to pass be-

hind the toll-house, where the eyes of the toll-keeper never looked. It had taken but a short time for the toll-keepers to learn that "Mr. Jones" could pass behind the toll-house with impunity, for he was the most influential politician in the neighborhood. As the months rolled by, less and less political influence secured the same immunity. The tolls did not even pay the keepers, so nothing was left for "maintenance of way" nor for dividends.

My last recollection of the scheme which was so bright in its inception, so perfect in its planning, and so certain in its beneficent results, brings back the hour when I stood in front of the old brick courthouse in Pittsboro and saw sold under execution the last section of the plank road running from that town to Haywood, at the head of the Cape Fear River. The entire section of twelve miles, including old plank, franchises, and rights of way, was placed on the block. One man bid $25. My old preceptor raised the bid to $26, as I recollect, and no one was found prodigal enough to raise his bid.

DEEPENING RIVER CHANNELS

Another important part of the general scheme for internal improvements, and one of the first undertaken, was the erection of dams and locks in the principal streams of the state, with canals around the shoal water, in order to make these rivers navigable up to the foothills.

Navigation companies were chartered for the Roanoke, Neuse, Cape Fear, and Deep Rivers, and a number of smaller streams. The state aided these several companies by liberal donations of bonds and subscriptions to stock. In the charter of each company, and an important part of the general plan, was a provision that the power from the canals, locks, and dams could be used for manufacturing purposes. What was the result?

In several instances, small boats were enabled to successfully pass locks, and navigation was temporarily improved; but no manufacturing enterprises were launched.

The state was compelled to purchase at mortgage sale the works of the Cape Fear & Deep River Navigation Company. Finding that it could not successfully carry on the work, the State Convention, by an ordinance, attempted to donate the property and franchises to a railroad. Later by special act the whole was sold to a private concern which had already purchased the rights of the railroad. Now, one of its successors is operating a large cotton mill by water-power, and a flourishing town has been established, while at other places electric light and power companies are in operation. The Roanoke Navigation Company also passed into private hands, by special legistation, and Weldon and Roanoke Rapids are rapidly growing factory towns.

STATE OWNERSHIP OF RAILROADS

The feature of the general scheme for internal improvements which called for the greatest outlay of money was the building and operation of railroads. The Raleigh and Gaston was the first railroad chartered. It was created by act of 1835, was constructed in the early 'forties, and was completely under state control. But it was a dismal failure from the beginning. The receipts fell far short of paying the operating expenses. A connection being needed, Governor Graham suggested an extension from Raleigh, via Hillsboro and Greensboro, to Salisbury. Later an act was prepared by Mr. Ashe, which became a law, creating the North Carolina Railroad Company. This company was incorporated by the legislature of 1848–49, the state subscribing to a large majority of the stock. The road was built from Goldsboro to Charlotte, 223 miles, and was operated for a time by the state, with some slight degree of success.

The survey of this road tells why its operation by the state could not be a complete success. Beginning at Goldsboro, its eastern terminus, it runs in a northwesterly direction for nearly seventy-five miles, until it reaches the present city of Durham. The course there changes to nearly west for some sixty miles, until Greensboro is reached, about forty miles from the Virginia state-line. Then it makes a great curve until the course is changed to nearly south for eighty or ninety miles, ending at Charlotte, almost on the South Carolina state-line. In its course the road makes almost a complete horseshoe.

The project passed the General Assembly by the vote of the presiding officer, Hon. Calvin Graves. Unless the road had gone to the home of Governor Morehead, had passed by Hillsboro, the home of Secretary of the Navy, Governor, and United States Senator Graham, and other distinguished men, had taken in the state capital in its route, and terminated in the midst of the descendants of

the signers of the Mecklenberg Declaration of Independence, it could not have come into existence at all.

So long as the state attempted to operate it, the political factions along its route had to be appeased by seats in its directorate, and favors more or less discriminating were a necessity both to individuals and to influential centres.

In 1871 this road was leased for thirty years to the Richmond and Danville Railroad Company. Some time before this lease expired, it was leased for ninety-nine years to the Southern Railway. On the occasion of each lease the local politicians who had received favors, as well as those who expected them, made themselves heard; but the business judgment of the state, as well as the courts, sustained the leases. While the lessees have not by any means done what they might have done, the development of the state along its lines is one of the features of the South's progress. It needs no saying that the road under private management has been a great financial success. The stock readily brings on the market 175, and more, and the state's income from its shares is safe and certain.

A SECOND RAILROAD EXPERIMENT

It was a part of Governor Morehead's dream that North Carolina should have a great through system of railroads from mountains to seashore. To carry out this idea, a charter was obtained for a road from Goldsboro, the eastern terminus of the North Carolina Railroad, to the coast at Morehead City, a place named in honor of the Governor and then considered a great city of the future. The state took 12,000 of the 18,000 shares of stock, appointed a majority of the directors, and has had absolute control.

This road has now been operated by the state of North Carolina for nearly half a century, in war and peace, by Democrats, by Republicans and by Fusionists—each with varying degrees of failure. The private stockholders for years have pleaded for a lease, or for anything to avoid a continuance of political mismanagement. During these many years no dividend has been earned, though one or two presidents declared dividends of one or two per cent. per annum for political effect, when every cent should have been used in betterments. The stock value ranged from ten to twenty-five cents.

Finally, under the administration of Governor Aycock, it became known that the administration had determined to heed the cries of the private stockholders and the sound business judgment of the people of the state, and lease this last of the state's railroads. A great sigh of relief went up from mountains to sea. The lease was not effected until after an attempted sensational receivership in the Federal courts and litigation by those who wanted to hold on to the teats. During this litigation, many evils of political management were made public, among others, the fact that every administration for years had employed prominent politicians in various sections, remote from the railroad, as "local counsel," thereby enabling them to receive free passes within the letter, but against the spirit, of the state statute prohibiting free passes.

The effects of the lease were immediate. The first year of private management improved the road-bed and equipment to a point never before approached. The road is being extended and new connections made, and is run upon business, as opposed to political, methods. The service, both passenger and freight, has been nearly doubled. Favoritism has been abolished. The stock has advanced to from sixty to seventy cents, and would be higher but for the fact that certain politicians, many of whom participated in making the lease, have instituted litigation in an endeavor to annul it, for want of power and the like.

The state aided in various ways in the construction of the Wilmington and Weldon, the Raleigh and Gaston, the Raleigh and Augusta Air Line, the Wilmington, Columbia, and Augusta, the Western North Carolina, the Cape Fear and Yadkin Valley, and several other railroads. But experience followed experience quickly, each a protest against state management and control, until North Carolina disposed of or lost all of its railroad properties, except its stock in the North Carolina Railroad and in the Atlantic and North Carolina Railroad.

It is proper to state that in the condition of affairs then existing these railroad lines could not have been built without state aid. Their construction afforded great relief to the people and promoted local development along their lines. They were worth to the people and to the state all that was paid out for them. In the early days it is doubtful if private management could have been very successful,

but certainly state management was a dismal failure.

Practically the entire funded debt of the state, amounting to something over $6,000,000, originally arose out of the plans for internal improvements. The increase in value of the state's stock in these two roads under private management, if now sold at ruling prices, would pay off the entire state debt.

The leases upon these two properties expire at the same time. Possibly in a century from now, politics will become so pure, politicians so wise, and political management so businesslike that North Carolina may again experiment with the ownership of public utilities. The thinking people of the state pray that it may not make the attempt before that time.

STATE OWNERSHIP OF RAILROADS IN MISSOURI AND PENNSYLVANIA

SIX FAILURES WITH A LOSS OF $25,000,000 IN MISSOURI, WITH ONE SUCCESS—PENNSYLVANIA'S UNHAPPY EXPERIENCE WITH GRAFT AND POLITICAL DISCRIMINATION

BY

C. M. KEYS

(FORMERLY RAILROAD EDITOR OF "THE WALL STREET JOURNAL")

"I DOUBT," says Governor Folk, "whether Missouri would bond itself for the $300,000,000 or $400,000,000 necessary to acquire the intra-state railroad lines."

Much of the same kind of comment has come from other public men in other states since the night when Mr. Bryan announced to the world his revolutionary ideas. Governor Folk supplemented his statement at a later time by setting forth a plan for Federal supervision through the establishment of a Railroad Controller, with extreme power of supervision over the railroads, much like the supervision exercised by the Government over the national banks.

This is a mighty question. To its consideration must be brought the experience of the past. Fortunately, several states and many municipalities have already experimented in the ownership and operation of railroads.

The story of Governor Folk's own state, Missouri, is a melancholy commentary upon state interest in railroads. In only one case did this interest extend to ownership, and that for but a few months, but the net result of the state's experiments is a loss of nearly $25,000,000. It came about through funds advanced by the state to the pioneer roads, to be repaid with interest at various rates as the railroads made the money.

The principal of the advances made in this way amounted to $26,700,000. Only one road out of the seven to whom such aid was extended ever paid its debt in full. This was the Hannibal & St. Joseph, to which the original advance was $3,000,000. It paid off the last dollar of this debt, with interest, in 1883. Including interest, the total advance of the state to the other six roads amounted to $31,735,000.

When, after many defaults, the state seized the roads or ordered them sold, the total amount realized from such seizure or sale was only $6,131,000, leaving a net loss to the state of $25,604,000. The processes by which the roads were sold were among the most scandalous in the history of legislation in this country. For instance, the St. Louis & Iron Mountain and the Cairo & Fulton were sold to McKay, Read & Co., for $900,000, although several bids of over $1,000,000 were put in. The firm turned around and sold the roads at a profit of over $300,000 to one of the other bidders. General Fremont bought the Southwest Branch Railroad for $1,300,000, and immediately offered it for sale for $22,000,000. He did not get a bidder, and sold it shortly afterward at a profit of $100. The buyer went into bankruptcy.

The largest advances were to the Pacific Railroad. This company owed the state about

$10,800,000. The value of the property was supposed to be about $10,000,000, and the Union Pacific was said to have offered more than that for the road. It was finally sold in 1868 for $5,000,000, and the state debt was cancelled. In reporting the sale, the state's committee reported the "cost" of the sale at about $200,000 and "an amount of labor, pain, mortification, and degradation which this or any other company can never adequately compensate."

Go through the state of Missouri to-day and look for these hapless railroads, which cost the state and its leaders so much money, "mortification, and degradation." They have been taken in by the great systems—the Missouri Pacific, the St. Louis & San Francisco, the Iron Mountain. Nearly all of them are rich and prosperous. They pay the state some taxes year by year, but the memory of the debt to the state is fading rapidly.

Turn to the state of Pennsylvania and its history as a railroad builder and operator. This commonwealth was one of the pioneer railroad builders of the United States. It took out its first charter on March 14, 1828, and opened for operation its first railroad in 1834. This was the Philadelphia & Columbia Railroad. It ran from the corner of Broad and Vine Streets, Philadelphia, to Columbia. For the first ten years of its history, it was a combination steam and horse-power railroad. Shippers owned their own cars and could hitch their horses to them and haul them along the right-of-way. There was war between the horse-train and the steam train from the outset, arising out of the delight with which the drivers of horse-trains would stop along the main line to light a pipe, water the horses, or talk to the neighbors, while the steam train snorted behind, waiting to go ahead if it ever got a chance.

Difficulties gradually adjusted themselves until, in 1844, the horse-power privilege was abolished. Then came ten years of competition with other routes and facilities, notably the Pennsylvania Railroad. It ended, about 1855, with a sale of the state railroad to the Pennsylvania for $7,500,000, about twice what it was worth but about one-quarter of what it had cost the state. It is now an important part of the main line of the Pennsylvania. Under the deed of sale, the state surrendered its right to purchase the Pennsylvania Railroad.

Mr. William Bender Wilson, the historian of the Pennsylvania Railroad, has thrown much light upon the political conditions that arose from this experiment. The following paragraphs are vital to the question of state or national control of railroads:

> "The individual transporter who did not dance when the politician in charge of traffic piped was placed at a great disadvantage. His cars were not moved until after his competitor, who was a partizan, reached market; classifications were interpreted against him, and his cars were condemned by inspectors; every effort was made to compel his adherence, failing in which he was run out of business or badly crippled.
>
> "The free-pass system originated on the state works, and grew out of the assumption by public officials that they had a right to pass over the public highways, in going to and from the capital, free of tolls. County officials soon claimed that they were entitled to the same immunity in going to and from their respective county towns, and political hangers-on . . . enrolled themselves under the banner of free transportation. . . .
>
> "It became a potent factor in corruption, and reached such an extent that transporters who would do certain political work at an election would have their tolls rebated to an extent that nearly always reached a refund of the entire amount paid. The state debt grew and grew, until bankruptcy stared the people in the face."

Desperately, the people of the state of Pennsylvania turned to the comparatively youthful Pennsylvania Railroad for assistance. After more than twenty years of hard experience, Pennsylvania grimly pocketed its loss of over $20,000,000, and turned its back forever upon the gospel of state ownership of railroads.

There have been municipal railroads by the score. Holyoke, Cincinnati, Danville, Va., and many other cities have built small railways for their own needs. In most cases the roads were built to break a monopoly, to lower freight rates, or to adjust the traffic relationship with the municipalities in the neighborhood. Holyoke leased its little Holyoke & Westfield to the New Haven; Cincinnati sold its Queen & Crescent to the Southern Railway and the Cincinnati, Hamilton & Dayton. Therefore, both projects are doing fairly well.

This is but a light sketch of a few salient facts from the history of state and government control of and interest in steam railroads. It does not pretend to exhaust the subject by any means. Enough has been adduced to cast more than a strong shadow of doubt upon the probable results of any such scheme as that proposed by Mr. Bryan. Human nature in 1906 is not different from human nature in 1836. The count is flatly against state ownership.

THE ROMANCE OF TUNNEL BUILDING

THE SIXTEEN SUBAQUEOUS TUNNELS BUILT AND BUILDING UNDER THE RIVERS AROUND NEW YORK CITY—PASSENGER TRAINS TO RUN FROM NEW JERSEY TO LONG ISLAND, UNDER TWO GREAT RIVERS AND AN ISLAND—THE MEN ON THE JOB, THE DANGERS THEY FACE, AND HOW THEY ARE DOING THE WORK

BY

ARTHUR B. REEVE

WHAT does the bottom of the Hudson River look like from the inside, and how does it feel to work under it with a mighty river flowing over your head as you toil?

Ask the "sand-hogs" that are boring through it like moles. Better still, if your heart and lungs be sound—and your nerve—ask them to take you down with them under the river-bed.

That is a new kind of "thrill."

With an instinctive "last look" at the sky-line and the waves playing in the glad sunlight, you enter the elevator and drop from the surface to a "lock" at the bottom of the shaft. It is like going down into a mine.

You enter the lock, which is studded with bolts like a boiler. The heavy iron door is swung shut with a bang. Your only view of the outside world is through two thick glass portholes in the doors. A valve is turned on and compressed air from the tunnel begins to rush in with a hissing as of escaping steam. Pound after pound to the square inch the pressure slowly rises. You feel it in the drums of your ears, which begin to press in as though they would burst. They would if you did nothing to prevent it.

"Blow them out," says your guide. You pinch the end of your nose tightly and puff air sharply down your nostrils until the air enters the Eustachian tubes and pushes out the drums, thus equalizing the pressure on both sides of them.

Your voice above the roar of the in-rushing air sounds unnatural, as it would sound if you had all your teeth pulled out at once. To hear or to be heard it is necessary to shout, and things ring in your ears.

Pound after pound the pressure mounts until you wonder how much longer it is going to last. Degree after degree the heat increases, for air rushing in and being compressed gives out heat. You may not know what "thermal units" are, but you can feel them.

As it grows insufferably hot and stuffy, you begin to think of the dungeons of deep-moated castles of the Middle Ages. But you have little time to think. Every few seconds you must puff out your ear-drums.

"Whistle," says your guide laconically.

You purse up your lips and try. But if a thousand dollars were offered, you couldn't earn it. You can't whistle in compressed air. And if a man be so reckless as to smoke, his tobacco will burn out in short order on account of the surplus oxygen in the air.

At last the hissing noise begins to dwindle down to a wheeze and stops all of a sudden. The door into the tunnel is pushed open and you step out, your flannel shirt already soaked with perspiration. You can feel that it is cooler in the tunnel, and yet you perspire almost as freely as in the heat of the lock. That is another thing compressed air is reponsible for.

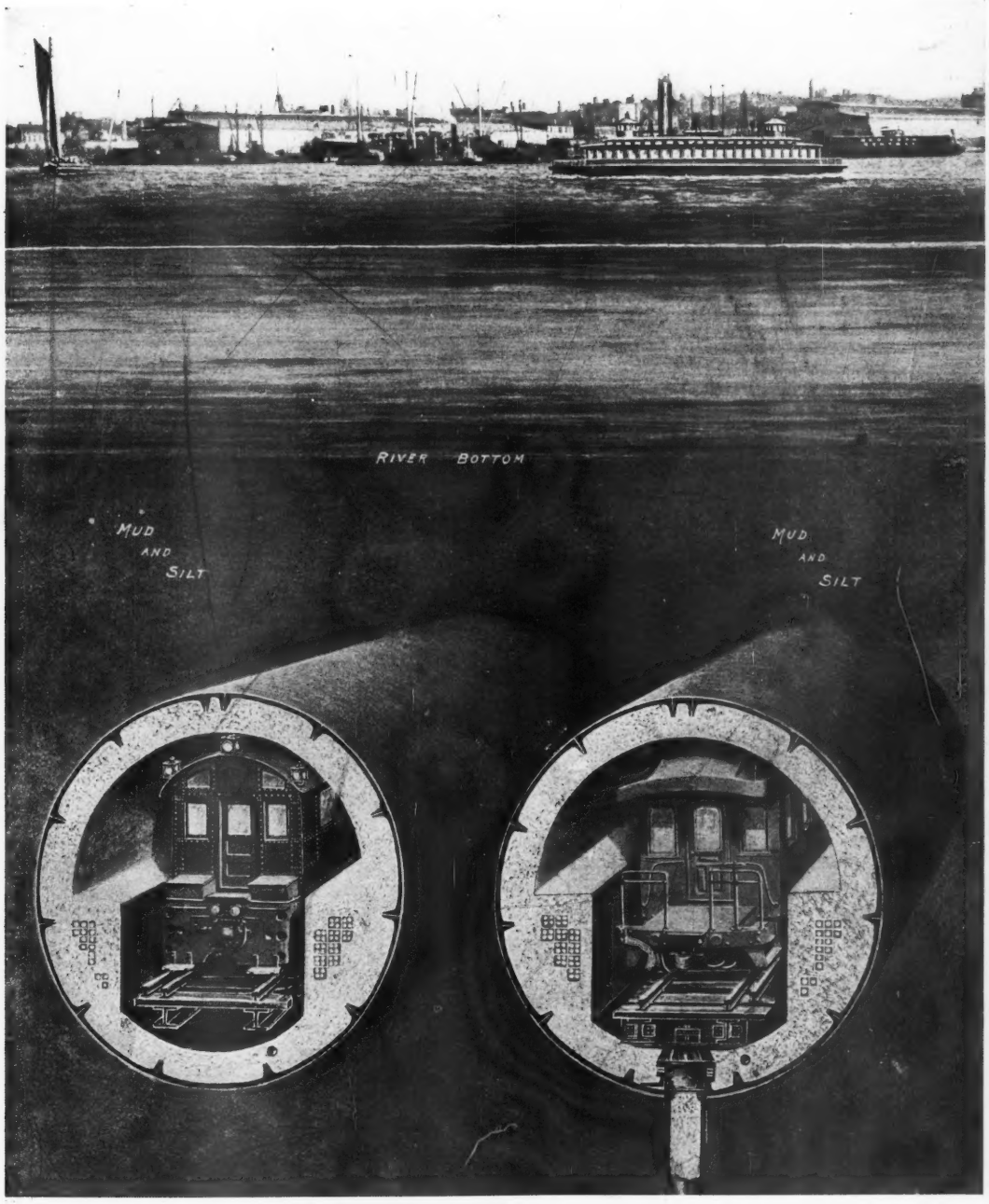
Along a suspended platform through the tube you follow your guide, fanned by the moist breath of the tunnel. Every few feet an incandescent light gleams in the misty darkness. After perhaps a hundred paces, you have to duck down under a semi-circular partition covering the upper half of the tube.

"What is that?" you shout into your guide's ear, the nasal ring of your own voice startling you.

"Emergency curtain," he shouts back.

Words are economized. Later you learn that should the tunnel start to flood, the other half of the emergency curtain can be dropped so as to cut off the in-rushing water. The tunnel itself could be nearly flooded and still safety could be found along the platform.

Below you are men pushing little cars full



TUNNELS UNDER THE HUDSON

A diagram showing two of the tubes with railway coaches on the tracks. Note the footpath on each side for emergency use. Beneath it are openings for wires and pipes

of "muck" or sand or rock taken out from before the shield. They and the men who do the shoveling are the "muckers." Pipes laid along the side conduct compressed air and fresh water, while electric light and telephone wires are strung all about. These, together with the tools and other accessories strewn along the tunnel, obstruct the narrow passageway to

such an extent that one must carefully pick his way between them. Imagine an accident, with the water rushing in and the tunnel in total darkness: then the peril of the men at the working end can be realized. The dash for life becomes a panic in which the workers often defeat the efforts made to save them.

You are surprised at the comparative dryness of the tunnel in its unfinished state. This is due to the fact that after the rings are erected "grout" (a mixture of cement) is pumped outside through a hole in each segment. The "grout" makes a continuous outside lining, filling the cracks and protecting the tunnel wall.

At last you reach the shield. At first glance the sight seems little short of bedlam. Burly Negroes shout at husky Polacks as they load "muck" on the cars. Other men are climbing about the compartments, excavating ahead of the shield. Another gang is erecting a segment of the newest ring. Everybody is apparently in everybody else's way. But you soon discover that what appears the most utter confusion is complete organization, considering

THE MEETING OF THE ENGINEERS UNDER NORTH RIVER, SEPT. 12, 1906

H. C. Booz, Charles M. Jacobs, A. Noble, G. B. Fry, John F. O'Rourke, James Forgie, F. J. Gubelman, A. J. County, B. H. M. Hewett, Dr. A. J. Loomis

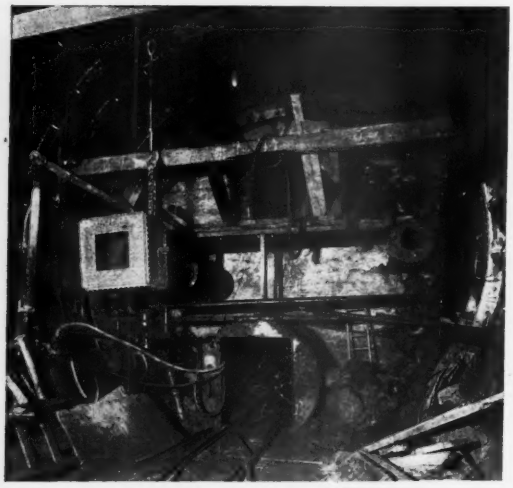
THE MEN BEHIND THE SHIELD

These "sand-hogs" have worked in compressed air for years and they risk their lives daily

the narrowness of the quarters. One gang excavates, another loads cars, another pushes the cars back through the tunnel, another erects segments, and so on.

If the pressure be in the neighborhood of thirty pounds, the men work three hours; then, after a three-hour rest above ground, they toil three hours more—making the tunnel-workers' day of six hours in the "air." If the pressure be low, say five or ten pounds, eight hours is the working day. Everywhere are foremen directing the work. Above all is the noise of in-rushing compressed air. If they are working through rock, the noise of the drills is deafening.

On hands and knees you crawl out into one of the compartments and experience for the first time the weird realization that only the "air" stands between you and destruction. At some points you can feel the air escaping, especially if the river bed dips down too close to the tunnel. The escaping air appears at the surface of the river in bubbles. When the loss of air is too great, scows dump hundreds of



A SHIELD FROM THE INSIDE

The men work in close quarters and it is no easy thing to get out of here when accidents happen and the lights go out

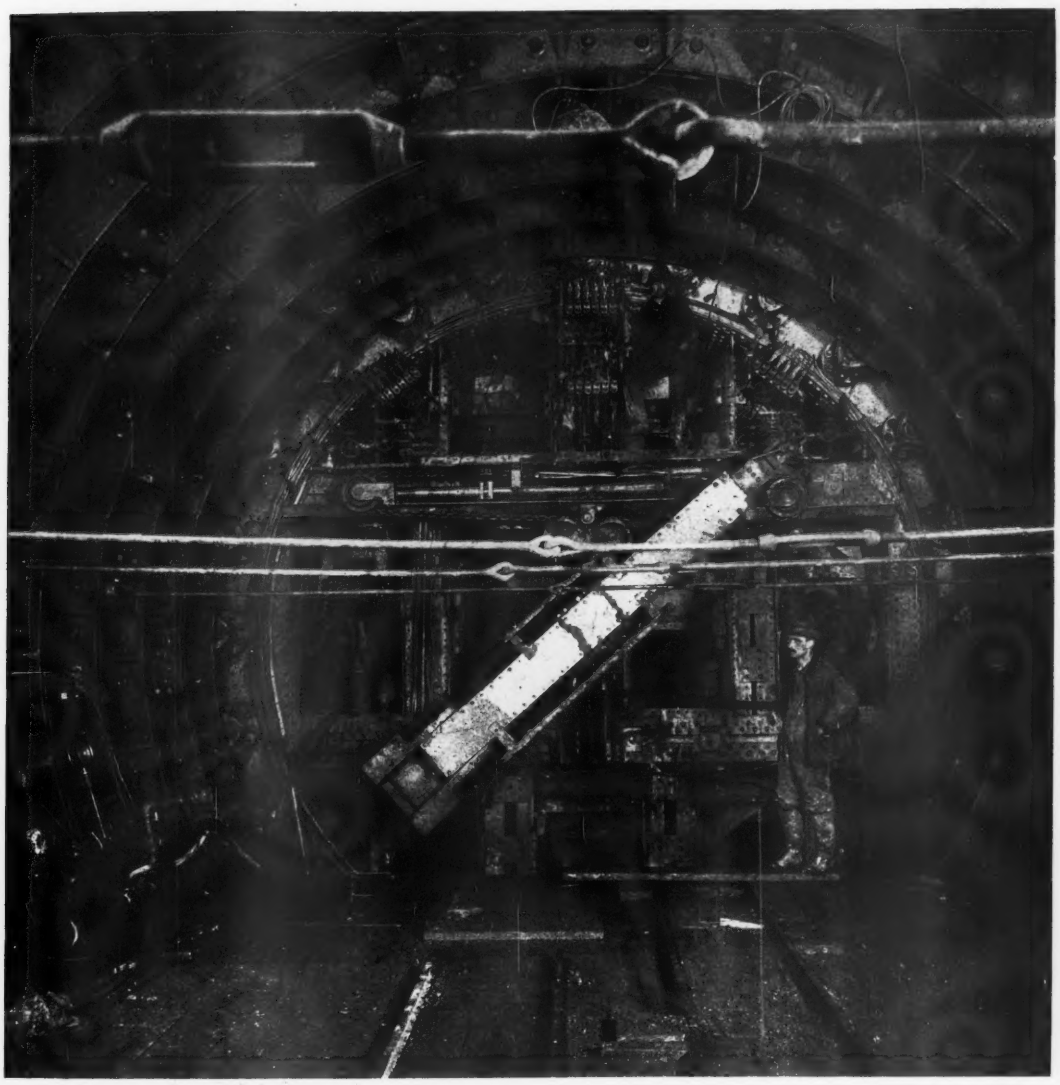
tons of clay into the river overhead and through this artificial river-bed work goes ahead safely. If the river-bed above become too thin, the "air" blows a hole in it. This occurred last year in one of the tunnels and a man was literally blown up through the river-bed, through the water, and into the air. More remarkable still, he was able to report back at once for work. At the same time, two other men were flattened out against the roof of the tunnel and held there by the "air," like flies on a ceiling.

Your curiosity satisfied by a glimpse of one of the most remarkable developments of modern engineering, you retrace your steps along the platform to the air-lock. This is the only dangerous part of your journey, for it is while coming out of the "air" that men are liable to get "the bends," a curious tunnel disease. From a pressure of thirty pounds, one should take about fifteen minutes to come out, the rate being roughly half a minute to the pound.

The air is let out slowly by turning on a valve leading to the outside atmosphere. There is a hissing sound and it grows colder in the lock, since air absorbs heat as it expands. It also grows misty. By and by one of the men in the lock with you starts to whistle, "Wait till

DRILLING BLASTING HOLES IN THE ROCK UNDER THE EAST RIVER

These men are working ahead of the shield shown in the picture above. Compressed air keeps the water from coming through the crevices



FOLLOWING BEHIND THE SHIELD

As the shield is pushed forward, the hydraulic erector (stretching diagonally across the photograph) picks up a section of the lining, weighing several tons, and holds it in place until the men bolt it down

the sun shines, Nellie," and breaks off with the remark, "We'll soon be out now."

At last the hiss of escaping air ceases. The door to the dungeon grates open. You walk up the tunnel to the shaft and are hoisted up to God's air again. You gaze out across the river with its waves dancing gayly in the sunlight. Down beneath it the "sand-hogs" are still rooting.

With sixteen tubes now built or building under the rivers which make New York City an island and eight others projected, Manhattan may be described as a body of land surrounded by tunnels. Three tunnel systems with eight separate tubes are being built under the East River to Brooklyn and Long Island City. Three systems with six tubes will pass under the North River to the Jersey shore, three of these tubes being already through. One system of two tubes is already in operation under the Harlem River as part of the Subway. Between the Brooklyn Bridge and the Battery, three systems comprising six tubes are projected by the Rapid Transit

Commission; and from Fourteenth Street in New York to Brooklyn another system of two tubes is projected.

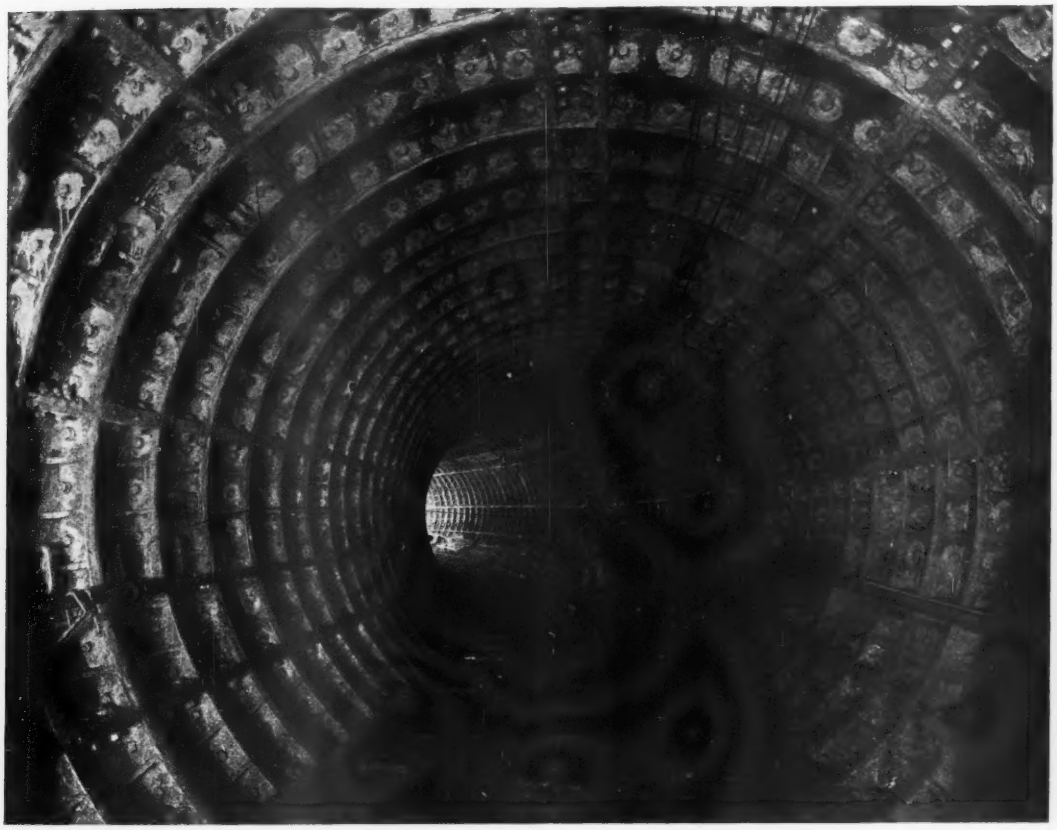
The first attempt at tunneling under the Hudson River (from Morton Street to Hoboken) began in 1874. The work was carried on until in the early 'eighties, when the compressed air blew out a hole in the bottom of the river and twenty workmen were drowned. After that the work languished and, though millions had been poured into the "rat-hole under the river," the project was abandoned. Engineers freely asserted it to be impossible to tunnel under the Hudson.

But subaqueous tunnels were being successfully built in London, so a company of English capitalists became interested in the deserted Hudson bore. The point where the first work had failed was in the "shield"—the head of the mole that pushes its way under the river, leaving the tunnel behind it. James Henry Greathead, chief of the early tunnel builders, together with Sir Benjamin Baker and Mr. E. W. Moir, both of Forth Bridge fame, designed an improved shield which they built in Scotland and shipped to America. With a gang of workmen—including "Paddy" Ryan, "Paddy" Fitzgerald, and "Jimmie" Brady, all men who have since made great reputations on tunnel jobs—the task of putting this shield in place 2,000 feet out under the river was begun.

Tunnel men still speak of this as the greatest single feat in the history of subaqueous tunneling. A huge balloon of canvas was filled with coarse hay and suspended from a scow. It was dropped into a conical cavity over the end of the tunnel, which was then full of silt and water. The balloon gradually settled as the silt was dug from beneath it, the hay plugging the end of the tunnel. The shield was then built under tremendous air pressure that so compressed the hay that it could be chopped like wood.

THE EMERGENCY CURTAIN TO PREVENT FLOODING

When the compressed air blows a hole in the roof and the water rushes in, the curtain (above the men shown in the picture) drops down and cuts off that part of the tube. The workmen escape (perhaps) through the smal emergency door above



A COMPLETED SECTION OF A TUNNEL

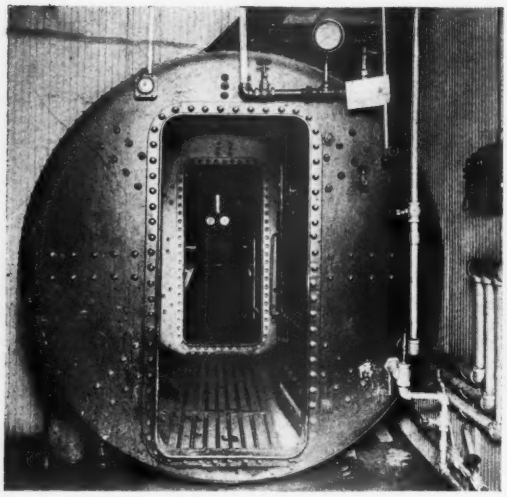
This is one of the sharpest curves that it has been found necessary to make

In those days it was necessary to heat rivets over forges. In bolting the shield, the utmost care was taken to lead away the fumes but the men "died like flies." Finally, after a hard struggle, the whole shield was bolted by hand. By this time the English capitalists' funds had run out, however, and for a second time the river seemed to have won against man.

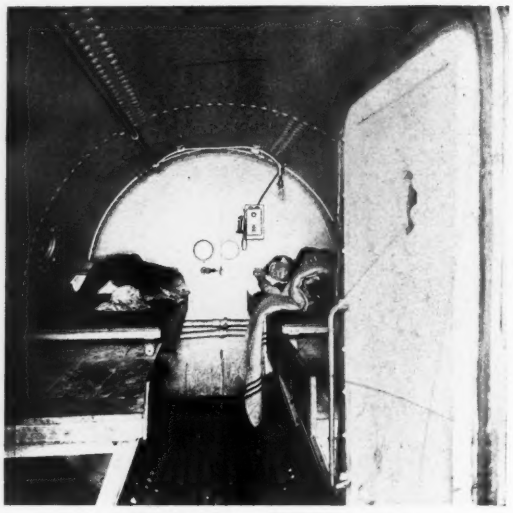
Meanwhile, Mr. Charles M. Jacobs was driving a tunnel under the East River to carry gas from Astoria to Manhattan. This tunnel, ten feet by eight, was the first subaqueous tunnel driven by a shield and with compressed air under the waters about New York. As a matter of fact, New York City was the pioneer tunnel builder, in the sense that the huge thirty-mile water conduit built under the direction of Mr. George S. Rice 400 feet below the surface of the Harlem River is a tunnel; but this was not done by the use of a shield or of compressed air.

For nearly twenty years the Hudson mockingly flowed over the sunken wreck of two disastrous ambitions. In spite of engineering opinion to the contrary, Mr. Jacobs held to the belief that the tunnel could be put through. Finally, in 1902, he persuaded Mr. William G. McAdoo, a New York lawyer, formerly of Georgia, to organize the New York and New Jersey Railroad Company, buy out the English rights, and take up the work again. Mr. Jacobs directed the undertaking. The old bore—twice abandoned, but the second time kept pumped out for fourteen years—was reopened. "Paddy" Fitzgerald, "Jimmie" Brady, and other expert tunnel workers started the shield forward from the Jersey shore.

They had not progressed far when a sunken reef of rock was encountered. Against it the shield would have crumpled up if pushed ahead, so the problem of boring through a roof of silt and a floor of rock had to be met. It was solved by constructing an "apron" ahead of the shield; this held up the silt while work-



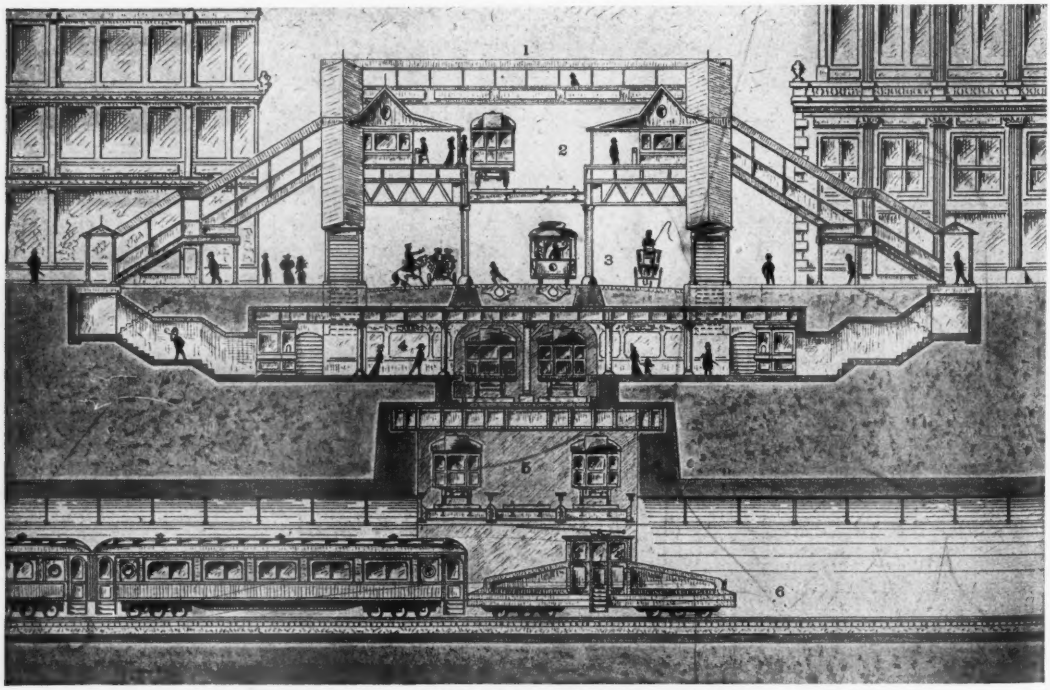
EXTERIOR OF A MEDICAL LOCK
For the cure of "the bends"



INTERIOR OF A MEDICAL LOCK
A patient being treated

men beneath it drilled and blasted the rock in front of the cutting edge of the shield. The same fifteen-year old shield crawled slowly along under the Hudson, until it met the New York heading early in 1904. The lateral alignment was found to be almost perfect and the grade was but a few inches out of the way. At last man had defeated the River.

The men who put the McAdoo tunnel through are now all working on the other tunnels. Mr. Jacobs is chief engineer of the North River division of the Pennsylvania's



TRAFFIC FACILITIES SIX TIERS DEEP

A diagram showing how a cross-section of Sixth Avenue will look after the tunnels are completed

(1) Foot-bridge for crossing the "L" tracks; (2) elevated street railway; (3) surface lines; (4) underground station of the N. Y. and N. J. R. R. Co.; (5) proposed New York Rapid Transit subway; (6) Pennsylvania Railroad tunnel.

tunnels from Thirty-third Street to Weehawken. He is also chief engineer of the two McAdoo bores and two other tunnels that are being built from Cortlandt Street to Jersey City, and thus is at the head of the engineering work of six tubes under the Hudson. In addition, he is consulting engineer on the four tunnels which the Pennsylvania, New York, and Long Island Railroad is building under the East River from the foot of East Thirty-third Street to Long Island City. Mr. Moir is now Vice-President of the firm of Messrs. S. Pearson & Son and is actively supervising the building of the four tubes to Long Island City. "Paddy" Fitzgerald is assistant manager to the contractors in the tunnel from Thirty-third Street to Weehawken, and "Paddy" Ryan is working in the Long Island tunnels. It seems that the lessons learned in the old McAdoo bore have been learned well. Out of it in some way or other came almost all the other tubes.

HOW A TUNNEL IS BUILT

The crucial point in tunnel building is the shield. Without it subaqueous tunneling, as we know it, would be impossible. In non-technical words, the shield is like the cover that fits over a tin tea canister. It caps perfectly the advancing end of the tunnel with its "face" and a "shell," extending back several feet over the completed tunnel wall. Inside this hood the tunnel is constructed in rings composed of a number of segments with inwardly projecting flanges which permit them to be firmly bolted together. When finished, the tunnel is usually lined with concrete, though some are bricked, making in either case a perfectly smooth wall. On each side is a shelf for wires and pipe-lines; it also offers a foot-path at about the height of the car windows, for use should trains be stalled.

If the tunnel is being pushed ahead through silt, it is sometimes possible to shove the shield forward without carrying the débris back through the tunnel, the silt simply sliding away from its face. If the mud does not slide away so readily, it is often possible to make room for the advancing shield as its cutting edge bites into the soft material by opening a door in the shield and letting the mud come through, sometimes in a jet almost as if from a brick-making machine. The tail of the shield is usually divided into compartments, in each of which is a sliding door. Through these doors it is possible to excavate ahead of the shield and even for the men to advance beyond the diaphragm, as the wall of the shield is called. When the material is not quicksand, the compressed air will itself hold up the roof of such an excavation, the pressure used at the ordinary depth of a tunnel being about thirty or thirty-five pounds to the square inch.

If the tunnel is being built through rock, the men advance ahead of the shield with pneumatic drills and blast the rock away in a huge circle, through which the shield can safely be pushed. Even when working in rock, it is necessary to maintain the air pressure to keep the water from filtering down from the river through fissures. When working through silt or sand above and rock below, the "apron" devised for the McAdoo tunnel is used.

The shield is pushed ahead by a circle of hydraulic jacks extending from the diaphragm of the shield and braced against the circumference formed by the flanges of the last completed ring of the tunnel. As the jacks shove the shield ahead the width of a ring, the shell slides over the outside surface of the tunnel wall and the segments that make a complete ring are erected inside it. So the tunnel grows ring by ring.

At times the tube must be driven ahead through quicksand, which runs away from under it and lowers its grade. If continued, this error would become very serious in the case of tunnels worked simultaneously from both ends. To overcome this, the shield is tipped upward by applying a little more pressure to the lower jacks than to those at the top. As it advances, it gradually sinks to the correct level.

The segments are too heavy to be held in place by the sheer strength of a gang of workers until bolted. This problem has been solved by the "erector," a device rotating about the centre of the tail of the shield like a diameter of the circle; this picks up a segment weighing several hundred pounds, carries it to its proper place, and holds it there until it is firmly bolted. This erector, which is operated by hydraulic pressure, is one of the most important bits of tunnel machinery.

MAKING BOTH ENDS MEET

Quite the most incomprehensible thing to the layman is how a tunnel can be driven from opposite shores and yet both ends meet in the middle of the river with only a fraction of an

inch error. In the Pennsylvania's tunnel recently broken through under the North River, the lateral alignment was found to be only one-eighth of an inch out of the way and the grade only three-quarters of an inch. The deviation was corrected before the headings were joined.

Ask an engineer about this and he will tell you it is a simple problem in trigonometry, to be worked out by the bright young men whom he employs for the purpose. Every time a new ring is laid the whole tunnel is resurveyed and the results in the two approaching headings compared. If the comparison show an error, the shield is steered to right or left, up or down, as required to correct it; segments curved to just the necessary degree are then inserted in the next ring.

When the tunnel ends approach within a few feet of each other, a pipe is sometimes driven ahead from one to the other. Through this pipe it is possible to sight and thus check the surveys by an actual observation. If any mistake has been made, it is possible to correct it to a thousandth of an inch before it is too late. When the shields meet, their walls and the jacks are removed. The shells, however, must be left behind the cast-iron lining, a final sacrifice to the work they have served so faithfully. Thus the junction of the headings is the strongest part of the tunnel wall.

In spite of the shield and other appliances, modern subaqueous tunneling would be impossible without the use of compressed air, an idea conceived by Admiral Cochran in 1830. Though compressed air and the hydraulic shield are in reality old inventions, it has only been within a comparatively recent time that their use has been commercially profitable.

In the office of Mr. Henry Japp, managing engineer for the Pearsons of the four Long Island City tunnels from Thirty-third Street, are four dials, one for each tube. A red-ink pen held on the point of a vertical arm moves with the varying pressure horizontally over the face of each dial. A circular paper dial ruled with concentric circles is rotated by clockwork back of it, exactly one revolution a day. On it the red ink traces a line which graphically records the air pressure for every moment. Each day a fresh card is substituted and the record of the preceding day filed. Thus, for every moment since the work began, a complete record of the air pressure within each of the tubes is preserved.

In the wonderful plant which has been installed for this gigantic work—the more wonderful in that it is merely temporary—are seven huge air compressors, capable unitedly of pumping 44,000 cubic feet of air into the tunnels every minute. From a large receiving tank the air is let into the tubes to maintain the pressure required. This, briefly, is the mechanism of maintaining and recording the air pressure in the shafts under the river.

The shield closes the working end of the huge subaqueous tube. The shore end is closed by an air-lock. This is simply a cylinder, in diameter about the height of a man, built through the wall that seals the end of the tunnel. At each end of the lock is a door. That leading into the outer air can be opened only when the one leading into the tunnel is closed and the air-pressure in the lock the same as that of the ordinary atmosphere. Conversely, the door leading into the tunnel can be opened only when the other door is closed and the air in the lock is of the same pressure as that of the tunnel.

THE MEN BEHIND THE SHIELD

Tunnel work is a highly specialized form of labor. The workers get a minimum of $3.50 a day and there are several thousand of them in New York. Most of them are recruited from the ranks of caisson workers, but many are tunnel workers only—a class by themselves, men who have worked in all the big tunnel jobs the world over. Large numbers are Negroes, for they stand the "air" best, but all nationalities are represented.

A union card certifies that a man is physically competent to work in compressed air. If the tunnel be non-union, applicants are sent to the company physician, who examines their physical condition thoroughly, especially heart, lungs, and throat. If the man be sound in these particulars he can with practical safety work in "air," if he will take care of himself. Men like "Paddy" Ryan, "Paddy" Fitzgerald, and a host of others have worked in compressed air more or less continuously for from ten to fifteen years.

Nor is "the bends" the uniformly fatal disease that it is usually pictured. In aggravated cases it is fatal, but in its minor forms many tunnel laborers have had it and are still working in compressed air. The disease is the result of air bubbles getting into the blood; it causes a man to double up, whence its name. Coming

out of high air pressure too rapidly is almost certain to induce the trouble.

"What does it feel like to have 'the bends'?" is a frequent question asked of tunnel workers. Answers one of the men who has had the disease badly and after several weeks in the hospital gone back to compressed air work: "Like the jumping toothache and the worst kind of rheumatism. If it hits you in the head you go daffy; in the stomach, it is like an awful colic; in the arms or legs, a painful numbness. Sometimes you are unconscious but more often you are keenly alive to the horrible pain."

"Recompression" is the cure for "the bends." The patient is placed in a "medical lock" and the air pressure is raised to that under which he has been working. The medical lock is composed of two air-tight compartments. The inner is provided with beds, a dial showing the air pressure, a thermometer, a telephone, and other appliances. The outer compartment is to enable a physician to visit the patient without altering the air pressure about him. The treatment is simply to reduce the pressure gradually so as to get the air bubbles out of the system.

For the numbness there is an electrical treatment, but of all remedies that doctors have for this baffling disease, nothing works so well as "recompression." One of the latest devices for this method of treatment is an automatic valve which Mr. Henry Japp, managing engineer for the Pearsons, has invented and just installed in his medical locks. It enables perfect regularity in the reduction of air pressure to be obtained.

HEROIC TUNNEL RESCUES

Tunnel laborers are a high grade of workmen and among them are scores of potential heroes, although they would laugh if told so. Every time there is a "blow-out" this fact is dramatically demonstrated. An example of this occurred last June in one of the East River tunnels. After a blast had been exploded, the thirteen men who were working 500 feet out under the river and perhaps seventy-five feet below it hastened forward, only to be confronted by a rush of swirling water and mud. The dreaded "blow-out" had occurred. Part of the roof formed by the river-bed had given away and water was rushing in while the protecting "air" was rushing out.

The lights grew dim and the tunnel filled with fog, as it always does under a "blow-out." Stumbling and groping, the men turned and rushed frantically back to the air-lock. The big air-lock was closed. The foreman tugged at the door but it did not budge. The only thing left to do was to scramble up to the small emergency lock above. The men were in a panic. Action must be quick if they were to be saved. If two men got wedged in the door, big enough only for one, a precious minute might be lost and with it the lives of all.

That was just exactly what was about to happen when the foreman seized a pick-handle lying on the floor. With this weapon in his resolute hands, he lined up the panic-stricken men and made them crawl one by one through the narrow opening to safety. Then he crawled through himself, not a minute too soon, for the water was already entering the lock as he banged the door leading into the tunnel. Safe in the lock, one of the men not yet recovered from his fright turned on the valve so hard that they would all probably have had "the bends" if the heroic foreman had not stood guard over the valve with the pick-handle until he had brought the party out without the loss of a man.

A few days later, in another tunnel, thirty men were working out about 120 feet from the lock when a "blow-out" occurred. "Danger" shouted someone, and the whole gang made for the air-lock. They made it easily and closed the door—all except two men who had volunteered to stay and see if the hole in the river could not be stopped up. Often it is possible to plug a small hole with a coat or shirt, and the river-bed will close the hole made by the "air."

This time the hole was too big to be plugged and back the two daring men followed in the footsteps of their comrades, who were already in safety. When they reached the lock, half-walking, half-swimming, they found the water had risen until it covered even the little glass porthole in the door, by which they could see and be seen by their fellow-workmen in the lock.

Overhead was the smaller lock for such an emergency. Somehow or other they managed to reach the valve and then began a race between the rising water and the compressed air which was entering the emergency lock so that the door into the tunnel could be opened. It was a race for life and the two men won. When the water was nearly half-way up to the glass porthole in the emergency lock, they swung the door open and almost literally swam

into the lock and closed the door against the river.

Fire is another tunnel horror. While they were sinking the shaft in the middle of the river for another of the tunnels, a fire broke out in the compressed air chamber. The men were working in a caisson at the time and the temperature was raised considerably. Not dreaming what was the matter, they closed the valves in order to work. When they were opened again the fumes of burning rubber hose and other material rushed in.

The six Negroes who were working in the caisson were half suffocated in a minute. "Rap! Rap!" they pounded on the iron wall of their dungeon, conveying to those above them the news of their peril. Caisson workers say this "Rap! Rap!" of the danger signal is the weirdest sound they know.

The men above realized at once the danger to their comrades below. The compressed air chamber into the caisson was opened, but while that might save the men from suffocation it would let the water in and they would be drowned. Some one must go down there and save them. The night superintendent refused to let anyone else risk his life. He climbed into a huge iron bucket and had the men at the top of the shaft lower him into the caisson. In a minute they heard the "Rap! Rap!" to pull him up. He came to the surface with his eyes fairly starting from his head, more dead than alive—but he brought with him two of his men. After a rest of a few moments, he insisted on being lowered again. This time he came back with only one companion, but the man was dead. As the bucket was hauled up the superintendent himself toppled over, exhausted. The other three workmen were either drowned or suffocated. But again a man had risen up who could see his duty in a flash and rise to it like a hero.

Fortunately such accidents are not of frequent occurrence. When they do happen there is always somebody—official or "sand-hog"—who steps forward and meets the emergency like a soldier.

THE SIXTEEN TUBES AND THEIR SERVICE

The two tubes at the Battery are being pushed across to Brooklyn under the supervision of Mr. George S. Rice, chief engineer of the Rapid Transit Commission. The work is being done by the New York Tunnel Company, whose President, Mr. D. L. Hough, was associated with Mr. Jacobs on the gas tunnel. These two Battery tubes were the first East River tunnels to be started (March, 1903), and are likely to be the first finished. By the close of 1906 the 7,186 feet will be completed in one tube, and the other should follow shortly. It will then take some time to finish concreting the walls. The inside diameter will be fifteen and one-half feet. Subway trains to and from Brooklyn will run through these tunnels at a high speed. The trains will act as pistons to ventilate the tubes and at each end will be ventilating shafts with fans.

The four Pennsylvania tubes from East Thirty-third Street to Borden Avenue, in Long Island City have already been mentioned These are of large size, twenty-three feet in diameter, with a finished diameter inside of nineteen feet. These tunnels will be about 6,000 feet long.

At Forty-second Street a frantic effort is being made to get the "Belmont tunnels," as they are usually called, joined up. They are being constructed under the old Steinway charter which is being bitterly contested. The finished diameter will be only fifteen and a half feet, and they will be used to connect the trolley system of Queens County, recently acquired by Mr. Belmont, with New York City. The terminal will be somewhere in the vicinity of the Grand Central Station and it is understood that the tunnel will be continued across Manhattan to the foot of West Forty-second Street making connections by transfers at various points. The tubes are being driven under the river about six thousand feet from shafts at four points: one on each shore of the river and one from a shaft sunk down through a reef south of Blackwell's Island in the middle of the river. On the New York side a fourth shaft is sunk at Third Avenue and Forty-second Street.

Tunneling under the East River presents many of the most difficult features ever experienced is subaqueous tunneling. Not only is rock met with at various points throughout almost the entire course of the work, but there are sand, gravel, mud, and, worst of all, quicksand. Under the Hudson it is usually said that the silt presents an easy problem. But much of the Pennsylvania tunnel work has been through material similar to the East River tunnels or other mixed ground quite as difficult, for a distance of over 3,000 feet. Under the river, where silt only is encountered, it is, of

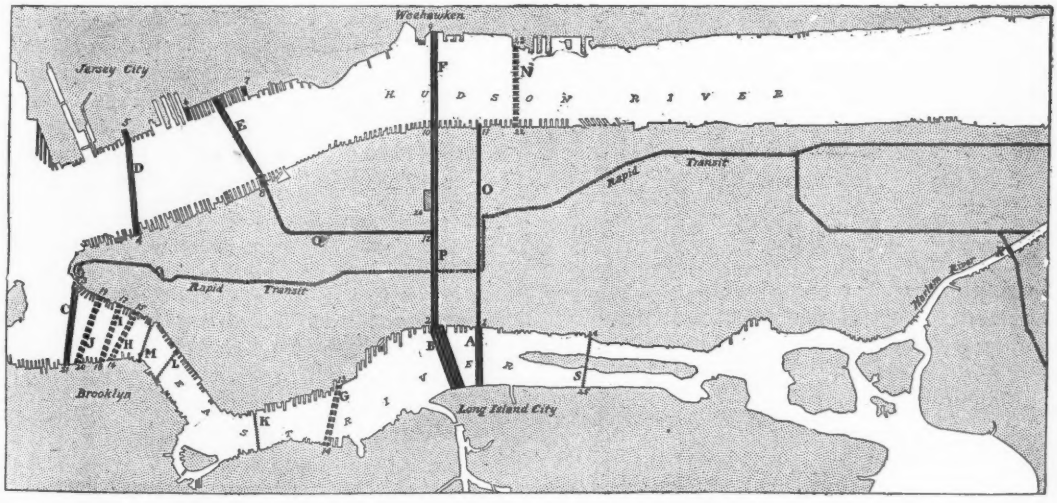
course, comparatively easy work to push the shield ahead, and record long-distance work has been accomplished. But that it has been an easy job, as has been implied in several accounts, is far from the truth. Much of the credit for carrying it through belongs to Mr. James Forgie, Mr. Jacob's chief assistant engineer. Mr. Forgie, by the way, was associated with both Sir Benjamin Baker and the great engineer Greathead. To have worked with Greathead in tunnel work is, it seems, something like "working with Dana on the New York *Sun*" used to be in journalism. Mr. G. B. Fry and "Paddy" Fitzgerald, employed by the contractors who did the excavating, share in the glory. But there is quite enough glory to go around.

Of these two tubes from West Thirty-third Street to Weehawken, the north tube was joined last September and the south about a month later. These are twenty-three foot tubes, 6,100 feet long, and part of the great Pennsylvania "New York Improvement," as it is called, extending from Harrison, N. J., to Long Island City—under two rivers, a range of hills, and an island. As heavy all-steel trains will be operated at a high speed through these tubes, the work of putting in a series of screw-piles—steel and concrete columns every fifteen feet, extending down from the tunnel wall to bed rock—is now being done.

At Morton Street, New York, are the McAdoo tubes, extending across the Hudson from the D. L. & W. and Erie Railroad terminals in Hoboken, and continuing uptown through Sixth Avenue by a new subway, to a terminal at Thirty-second Street. These tubes are 5,780 feet long, with an outside diameter of eighteen feet, one and one-half inches, and an internal diameter of fifteen and one-quarter feet. These tunnels are for trains.

Down at Cortlandt Street the Hudson Companies, which built the McAdoo tubes and of which Mr. Jacobs is the head, are constructing two more tubes which will strike Jersey City at the present Pennsylvania Railroad terminal, a distance of about 5,800 feet under water.

This circle of sixteen subaqueous tunnels, when completed, will extend more than sixteen miles under the waters about Manhattan, an engineering feat imperial in conception and execution. When the railroad and rapid transit trains are in operation, the residential area of New York City will be indefinitely enlarged. It will no longer be necessary for Long Island and New Jersey suburbanites to change from car to ferry and from ferry again to car, losing time at each connection. Railroad passengers will also appreciate the improved service, for they can be landed on Manhattan Island without change instead of, as now, disembarking in Jersey City.



"MANHATTAN IS A BODY OF LAND SURROUNDED BY TUNNELS"

A Belmont Tunnel, E. 42d St. to Long Island City. *B* Pennsylvania Tunnel, E. 33d St. to Long Island City. *C* Rapid Transit Tunnel, Battery to Brooklyn. *D* N. Y. & N. J. R. R. Tunnel, Cortlandt St. to Jersey City. *E* McAdoo Tunnel, Morton St. to Jersey City. *F* Pennsylvania Tunnel, W. 33d St. to Weehawken. *G* Tunnel from E. 14th St. to Brooklyn. *H* Tunnel from Beekman St. to Brooklyn. *I* Tunnel from Maiden Lane to Brooklyn. *J* Tunnel from Old Slip to Brooklyn. *K* Williamsburg Bridge. *L* Manhattan Bridge. *M* Brooklyn Bridge. *S* Blackwell's Island Bridge. *N* Proposed N. Y. & N. J. Bridge. *O* Belmont extension to W. 42d St. *P* Subway joining the Pennsylvania tunnels.

A FARMERS' COLLEGE ON WHEELS

THE JESUP AGRICULTURAL WAGON OF TUSKEGEE WHICH EDUCATES THE FATHER IN THE FIELD WHILE THE INSTITUTE IS TEACHING HIS CHILDREN—A KINDERGARTEN METHOD OF MAKING THRIFTY LAND-OWNERS OUT OF HAND-TO-MOUTH NEGRO TENANTS

BY

BOOKER T. WASHINGTON

THE Jesup Agricultural Wagon stopped in front of a little cabin where an old Negro was unhitching a bony mule from a ramshackle wagon. He had evidently just returned from town.

"What is that in your wagon, uncle?"

"Hay."

"How much did it cost?"

"A dollar and a quarter a bale."

"What is that man doing out yonder in your cotton patch?"

"Chopping out the crab-grass."

"How much do you pay him?"

"A dollar a day—but my crop's behind and I have to have him."

"Don't you know, uncle, that if you had a field growing nothing but crab-grass, it would be worth more than the cotton field you are hiring a man to chop the grass out from?"

The old man had not thought of that before, so our horses are let rest while we try to show him the foolish waste that comes from buying hay in town and hiring a man to kill hay at home.

The Tuskegee Institute, whose object has always been the uplifting of the masses of the Negroes, has been confronted with the problem of reaching just such shiftless farmers as the man with the hay. It is not enough to get the sons and daughters into the Institute and teach them useful trades and give them object lessons in good farming: something must be done for the fathers and mothers who cannot come to school.

This problem is being solved, in a large measure, by the Jesup Agricultural Wagon, made possible through the generosity of Mr. and Mrs. Morris K. Jesup, of New York, friends of the Institute. The wagon itself and the harness were made by our own students, and two large mules were purchased. The outfit includes different kinds of plows and planters, a cultivator, a cotton chopper a variety of seeds, samples of fertilizers, a revolving churn, a butter mould, a cream separator, a milk tester, and other appliances useful in making practical demonstrations. The expenses of operating the wagon are paid by the John F. Slater Fund.

FARM-TO-FARM DEMONSTRATIONS

Much previous work had of course been done through monthly farmers' institutes, and the results were far-reaching. But the wagon method has the immense advantage of going direct to the man in the field, where improved methods can be adapted to his particular conditions. We carry our implements out into his field. After he has plowed a few furrows, we hitch up one of our improved plows. "That may be a good plow for some," he says, "but for me, give me that old 'scutter.' " We use our plow for a few minutes and then ask him to compare the amount of work done and the kind of furrow. After that, we can hardly get away from him. They often try to borrow our implements and one man insisted that we remain at his house until he could plow over his cotton. When we come upon a man slowly plowing out his cornfield, we take out the cultivator and show him that he can make seven furrows where he is making one, and with the same animal. So convincing have these demonstrations been that many have at once bought improved implements. It generally means that boys between the plow handles may stay in school longer.

We often find the farmer's wife and children out in the field scattering fertilizer. A distributor taken from our wagon shows him that there is a quicker and a better way, and his family may at the same time be free to do something else. Great stress is laid upon the importance of the farmer's making his own

fertilizers. Many of them are renting land at $2.50 an acre and paying out $1.50 an acre for fertilizer. The wagon carries samples of the different kinds and the farmer is taught the amount needed by his land for a certain kind of crop, and just how to mix it. As a rule, the few that have already learned this lesson are those who have previously come in contact with the Institute either as students or in some other way.

SOLVING FOOD-SUPPLY PROBLEMS

The operator in charge of the Jesup Wagon pays as much attention to the kitchen as to the field, for experience has shown us that the wife must be taught as well as the husband, if real advancement is to be made.

Very few of these people have gardens. The wagon carries with it the finest vegetables that are grown in the county and many run out to buy when they might just as well be growing them. We show them how every family can raise on a quarter of an acre vegetables enough to keep from buying $100 worth of meat. We tell them what vegetables can be grown each month in the year and explain just how and when to plant and cultivate. Garden plows and other implements are brought out and their use shown by actual demonstration. The women folks are shown the superiority of the revolving churn over the old "dasher" churn, and how the use of butter moulds would make the butter more salable.

When we ask a family if they raise chickens, they are often surprised. Strange to say, many do not have a chicken on the place, so we find it necessary first to teach the simple lesson of the economy of poultry-raising, and then to explain the best way. The same is true as to hogs. We urge every man to have at least two hogs for each member of his family. Some families with ten or twelve children have but one hog. The Wagon has charts showing the relative merits of different breeds and the operator shows how they may be raised on pastures and on the waste. It is proved to them that a 300-pound hog is worth more than a bale of cotton, and costs comparatively nothing. Over and over again is taught the importance of every man's raising his own food supply, so that his cotton crop may be a cash surplus.

Naturally, the feeding and care of farm animals comes in for consideration. The possibility for every farmer to raise his own mules is brought up also. Mules cost from $50 to $200 and numbers of men are always in debt for them. By the time they get a team paid for, one or both animals are dead. With a brood mare and proper management, a crop could be made and a colt raised, as well. Only a few have ever stopped to think of this.

OPEN-AIR MEETINGS FOR FARMERS

After the Jesup Wagon has in this way made the rounds of the large and small farms of a community, a mass-meeting is held in the open air at some central point. These are largely attended, and the women and children come also. There are always a few successful farmers in every community and these are induced to bring samples of their products and to speak at the gathering. The wagon, in the meantime, secures samples of poor crops, without explaining the purpose, and these are also on hand.

Two stalks of cotton are held up to view and the bolls are counted. Close attention is given while a comparison is made of the yield per acre. Two stalks of corn are produced—one green, with one or two well-developed ears, the other "fired" and dying without an ear of corn.

"What makes the difference?" we ask.

"One hasn't been worked," somebody answers.

Then the man who raised the good stalk is called out and asked to tell the others how he succeeds.

"I fertilize my ground," he says, in substance. "I plow deep. I do not wait until the grass gets a start before I begin to cultivate. I spend my Saturdays in the field instead of going to town."

When the speaker sits down, we hold up a large bunch of grass, and show how the mass of roots runs down under the corn and cotton, absorbing the fertilizer and the moisture needed for the young plants. Demonstrations of this kind make lasting impressions.

Then other problems, say the question of acreage, are discussed in open meeting, in Sunday School fashion.

"How many acres did you plant in cotton last year," one man is asked.

"Forty."

"How many bales did you raise?"

"Twenty."

"And how many acres did you plant?" is asked of another.

"Twenty."

"And how many bales did you market?"

"Sixteen."

In this way, the farmers are put through the catechism as to crops of different kinds and on the replies is based the argument for a smaller acreage and a better distribution of the various crops. At the last meeting of this kind, it was agreed that they would not attempt more than twenty acres for each mule, and that the best arrangement would be ten acres in cotton, eight in corn, and two acres in potatoes, peas, sorghum cane, and peanuts.

THE NEGRO AS A LANDOWNER

These mass-meetings afford an excellent opportunity for emphasizing the gospel of Tuskegee, that every Negro should own his own home or farm. A typical case is taken of a tenant who moves from place to place every year, who plants no fruit trees nor beautifies his home, who cuts down the trees, allows the rain to make gullies in his field, and lets the farm "run down" generally.

"Why is this?" we ask.

"We don't want to work hard to cut off our own noses," somebody answers. "If we improve the place, somebody else will rent it over our heads."

"I have built up two farms and had to move," says another. "Now I let the place run any old way—and I can keep it."

"When I lived with Mr. Jones," says a third, "I set out a nice orchard, built a pasture fence, and cleared off a 'new-ground.' Then I was told that I couldn't stay the next year unless I paid more rent."

These replies give us a chance to bring home the fundamental duty of buying small tracts of land. The great question is—How? We urge them first to become the owners of a mule and the necessary tools; next, to buy a few acres of ground; then, when this is paid for—and not before—to build a good house on it. This means economy and self-denial, of course, but it can be done. We tell them of specific cases where Negroes have paid off debts of $1,000 and more with a single crop. Many of the landlords have large plantations and are paying taxes on land they never use. If a thrifty tenant remain on one place for a number of years, he ought to make an arrangement by which he will by that time become the owner of at least a few acres.

"But the landlords don't want to sell small tracts," somebody protests.

Then we explain how it was managed at Fort Davis by Rev. Moses Ellington. One of the Tuskegee Institute's teachers urged the Negroes of that vicinity to buy land. A small company was organized, a tract of 2,000 acres was bought, and it was then sold to colored farmers in lots of from ten to eighty acres. That was only five years ago, but most of these men now have nice homes and are good citizens. These farmers now have something to work for. When they set out an orchard, they know they can harvest the fruit. They reap the benefit of every gully they fill up, of every ditch they cut. They can say to their children: "This is your home; help to improve it." Within a few years, the colored people of one county in Alabama have bought more than 10,000 acres of land, and many of them have built nice houses.

CO-OPERATION OF THE WHITES

Since May 24th of the present year, this school on wheels has been moving throughout the farms of Macon and adjoining counties with instruction and appeals like these. It has brought these lessons home to an average of 2,000 people a month, and its circle of usefulness is steadily widening. Invitations are coming in from all parts of the county and from places many miles from Tuskegee.

The white people are taking great interest in the movement and many of them attend the meetings, listening as eagerly as their colored brethren. White men owning large plantations invite the Jesup Wagon to visit their tenants, and they are active in working up the meeting.

They are, of course, quick to see that a movement of this kind not only has a direct bearing on the welfare of the community at large, but affects also their own individual prosperity. It requires no long-sighted wisdom to see that a tenant thoroughly aroused to the advantages of improved methods in farming is a more desirable tenant than one content to jog along in the ruts worn deep by generations of shiftless farmers.

The prevailing conditions and methods suggested by the incidents in this sketch are not exaggerated. They will be recognized as true to life in many parts of the South, particularly throughout "the black belt." The Jesup Wagon with its object lessons will do much to break through the hard crust of custom and prepare for a new agricultural era in the section over which its influence extends.

WHAT A MAN GETS BY REST

THE REPAIR OF WASTED ENERGY AND BROKEN-DOWN TISSUE COMES DURING INACTIVITY—EFFECTIVE WORK DEMANDS ADEQUATE REST—THE MERE ACQUISITION OF FACTS IS NOT GROWTH

BY

DR. LUTHER H. GULICK

GROWTH is predominantly a function of rest. Work is chiefly an energy-expending and tearing-down process. Rest following work is chiefly a building-up and growing process. Work may furnish the conditions under which subsequent growth may occur, but in itself it is destructive. By work we do things in the world, but we do not grow by work. We grow during rest. Rest is not the only condition of growth, but it is one of the essential conditions.

We seek concentrated food. We seek concentrated reading; the day of the three-volume novel has passed. We demand that the world's news shall be epitomized. We demand that our writing shall be taken down in shorthand and written by machine. We demand that business shall be done by telegraph, telephone, or wireless. We demand that our expresses shall travel fifty miles an hour, or more, and that while on the expresses we shall be able to economize time by having stenographers and libraries. We read on the cars. The habit of reading during meals is growing.

All these concentrated activities, these ways of doing more work in less time, of shortening the period between thought and action, between the conceiving of an idea and its working out into the real world—or perhaps more truly the visible world, because the real world is the thinking world—make immensely for world-achievement. But they tend to dwarf the individual by sapping his power.

I might caricature this aspect of the times by taking a splendid frame and then pasting on some neutral background within this frame pictures of the world's masterpieces. The pictures should be fitted as closely as their forms permitted. They should be cut in outline, so that no picture had a background. Every bit of background should be fitted with some other picture. Every inch of space should be economized by filling it with some beautiful, worthy thing. In a frame measuring three by four feet, I could have a large fraction of the world's masterpieces in representation. But it would give me neither happiness nor any true conception of these masterpieces, for none of them would have setting or margin.

Proper setting and proper margin are essential to every work of art. So if life's work and life's thinking are to result in growth, they too must have their margin, their proper setting, their opportunity for assimilation.

During the day the chief work of the body is done, but during the night the tissues grow more than they do during the day. At night the food is worked over, the muscles are built up, the brain tissue is restored, the exhausted nerve cells become refilled and their crinkled borders become smoothed and rounded. This is margin, this is setting.

The process is not less necessary with reference to mental work. The student who spends all of his available time in the acquiring of facts, misses the chief end of study. Wisdom does not consist in a knowledge of facts, but in their assimilation—just as art does not consist merely in form and color, but also in margin and setting. Our facts need assimilation. They need to be worked over into the tissue of our mental life. The daily emotions, the struggles, the ideals that come to us need to be worked over into the self. This occurs chiefly during quiet, during rest. The man who has no quiet and no rest assimilates relatively little. A man's experiences must be turned over and thought about. A man's ideals must be dreamed over and dreamed out.

It may be true that sleep bears somewhat the same relation to mental growth that it does to physical growth, and that thus partially or even entirely in an unconscious way the facts of daily life are worked over into the tissue of

character. It is certainly true that we often awake in the morning after a good night's sleep and find problems solved, the mental atmosphere clarified in a way that is altogether surprising, and which is apparently not to be accounted for merely by our being more rested. We know that the brain is not wholly inactive during sleep. We know that there are psychic processes going on of one kind or another. I do not know what direct evidence could be procured to prove or disprove this hypothesis. It does seem, however, to fit in with very many well-established and otherwise not adequately explained facts.

The best work that most of us do is not begun in our offices or at our desks, but when we are wandering in the woods or sitting quietly with undirected thoughts. From somewhere at such times there flash into our minds those ideas that direct and control our lives, visions of how to do that which previously had seemed impossible, new aspirations, hopes, and desires. Work is the process of realization. The careful balance and the great ideas come largely during quiet, and without being sought. The man who never takes time to do nothing will hardly do great things. He will hardly have epoch-making ideas or stimulating ideals.

Rest is thus not merely in order to recuperate for work. If so, we should rest only when fatigued. We need to do nothing at times when we are as well as possible, when our whole natures are ready for their very finest product. We need occasionally to leave them undirected, in order that we may receive these messages by wireless from the Unknown. We need to have the instrument working at its greatest perfection, be undirected and receptive. I am not advocating a mystic ideal.

The fundamental characteristic of youth is growth—happy, continuous growth. Is not the reason why so many of us look back to youth as the period of greatest happiness because it was the time of greatest growth? I think that the people whom I know as most happy in middle and advanced years are those persons who have kept on growing.

The as yet relatively little known researches of Cajal and Flechsig have shown us that the tangential fibres of the brain may continue their growth at least through middle life, and it appears also that these fibres are in some way directly related to intelligence. Most people seem to stop growing soon after they become twenty. Other people keep on growing for varying periods. The duration of life's growth is governed partly by heredity and it is partly under our own control. Growth is limited by forced work without rest and margin. It is promoted by wholesome living. It is interfered with by routine work without a break. We must do unhabitual things if we are to grow.

All this may seem like the statement of an impossible ideal. It is not. There will come weeks and months when every ounce of strength and every moment of time must be spent on the accomplishment of certain things. But when this is a man's constant life, when it occurs month after month and year after year, then it indicates that the work has mastered the man. The man is no longer the master; he is the slave. It means that his growth and his capacity to do larger and larger things are prevented.

I know men as secretaries of Young Men's Christian Associations, as college physical directors, as the owners or directors of immense corporations; I know women as housewives and mothers of large families, who have preserved this balance between work and rest so that they have continued growing, so that their ideals have enlarged from decade to decade, so that their response to life has been ever larger. But with these people there has been a clear comprehension of the tremendous tendency of the time away from margin, away from rest, away from balance. They have set their faces like a flint and have not allowed the immediate pressure of the moment, the drag of the deadly detail, to so chain them down as to prevent their moving toward the far larger and more important ideal that is farther in the distance.

A dime held close enough to the eye will shut out the whole world. The small duty close at hand may shut out all vision, all ideals. The great ideals are never near. The small duty is always with us. There are always things to be done. In order to achieve the greatest which is within each one of us, we must balance between the small duties which could never be completely done, had we ten times our present time and strength, and the distant ideals. We must be able to say to the immediate and small: "Stand back! That is your place. This is the time for rest, for margin, for assimilation, for growth."

Rest is as important as work. Dreams must precede action. Concentrated art is not art, and the acquiring of facts is not growth.

THE NEW SCIENCE OF BUSINESS

A LESSON IN ADVERTISING

MANY advertisers think that a lot of general publicity from advertising ought to make bricks and build big buildings. It won't do it."

Mr. H. G. Ashbrooke, advertising and sales manager of the Glidden Varnish Company, thus suggested the secret of his success through general publicity advertising.

The results of his seven years' advertising campaign are summed up in these figures:

SALES

1899	$20,000
1900	20,000
1901	20,000
1905	$1,200,000

Increase of sales in seven years—6,000%

"How did you succeed where so many others have failed?"

His answer was as follows:

"I have reasoned that there are four essential elements of success in selling a commodity by means of general publicity advertising: 1, An article of household utility everywhere, as useful in one locality as in every other, so that the advertising will appeal wherever it is read. Also an article that is as good as, or better than, anything of its kind on the market, and of such cost to manufacture that it can be sold at a price to meet competition; 2, money to spend for advertising; 3, the nerve to spend it; 4, the good judgment to spend it judiciously.

"Consider the first point. Any man who has a million to spend for advertising and who thinks he can spend it successfully to advertise an inferior product had better save his money. Why? Because, though he may attract some trade by this advertising, he can't hold it with the goods, and consequently he can't keep his hold with the dealers. He is sure to lose in the end.

"On the second point, a manufacturer can afford to spend the money if he can get the results.

"The third point is very important. Many advertisers who do not get immediate results become disgusted after a brief campaign, and declare that there is no profit in advertising. They lose sight of the cumulative effect of advertising. We got no results from our expenditures until the fourth year. And the chances are good that the disgusted advertiser is the man who expected the advertising to build his brick buildings without further efforts.

"This last sentence suggests the secret of our success. I consider advertising as only a means to an end, as a starting point from which to work on the dealer. We cannot tell—cannot even guess—how much of our product any particular advertisement has sold. We don't try to. But we can tell just how effective a year's advertising has been in stimulating our business with the retail dealers.

"The dealer is the important person to the manufacturer. Our advertising is of no value to us unless it serves to interest him in selling our goods. He is human, and will not be persuaded to make them a specialty except from self-interest. We must show him that, if he will coöperate with us, our advertising will help him sell more goods.

"We seek this coöperation by every means we can devise, because we know that ultimately the dealer's interest in us or his indifference to us will make or ruin our business.

"We use our advertising to secure this coöperation in many ways. For instance: every one of our salesmen carries a set of cards, on which are pasted copies of our latest advertisements. He shows these cards to his customers, explaining what we are doing to make our product familiar to every housekeeper. Then he makes this argument: that the dealer, by making displays of an article which is already widely known, can thereby add to his sales, not only of that article, but also of everything else in his store. The salesman further points out that the dealer can still more closely link his store in the public mind with our general publicity by advertising the fact in the local papers that he carries in stock our advertised goods.

"Then, if the dealer is convinced, he is supplied, without cost, with set pieces and posters to help make his display attractive. If he likes, our salesman will dress the window for him from model displays that we prepare at headquarters. If the dealer decides to advertise, the salesman will supply him with a book of special advertisements written by experts for this purpose, and with electrotyped cuts. We are constantly preparing new set pieces and new advertising 'copy' for these uses.

"We have another method of encouraging the dealer to make window displays of our goods. We set apart the first week in April, every year, and call it 'Our Week.' We send the dealer pamphlets telling him that this is house-cleaning season, and therefore the best time to make a display of our goods, which are especially useful at this time. We keep him interested in the possibilities of increased sales, by our circular letters. Then we offer cash prizes for the best window displays. This year these prizes ranged from $5 to $100 apiece, amounting to $1,500 in all. More than five hundred dealers entered the competition last April.

"Every week we send out a pamphlet to the dealer, explaining our latest work in advertising, telling him how he can coöperate with us to his own profit, describing new methods in store management, giving pictures of effective window displays. We are thus trying in every possible way to make ourselves so useful to the dealer that he has us constantly in mind and is our friend.

"Thus you see how we consider our advertising. We do not expect it to draw business by itself. People are too busy to hunt all over town simply to buy what we advertise. But if we persuade the dealer that people will buy because of our advertisements if he will display our goods, and that he can thus get the advantage of our advertising, we have won a customer whose orders will grow constantly larger. That is why our advertising pays.

"The first three years during which we advertised showed no appreciable results. But during the fourth year the accumulated effect of the publicity, combined with our unceasing work with the dealers, began to get results, and the last four years' work, built on that foundation, has increased our sales sixty-fold.

"Here is another point. The product we advertise is only one branch of our business. It is the part of it that is susceptible to general advertising, because it is a household article of general consumption. Our other products go to manufacturers. But, through the friendships we have made amongst the dealers, we have increased the other branches of our business. These dealers know us, like us, and will buy our other products at the same time when they give us orders for our advertised goods.

"Our advertising appropriation remains a fixed proportion of our sales receipts every year. For instance, suppose we assume that our sales this year are $100,000, and that we spent $10,000 last year in advertising. We would figure that by spending $15,000 this year in advertising we would increase next year's sales to $150,000, and so on. We have paid $18,000 for a single advertisement, inserted once.

"As an evidence of what the general increase in the business has been in seven years through this work, the new plant we are building will occupy ten acres, whereas the old buildings occupied two acres. That fact is the best commentary on our faith in publicity advertising, backed always by work on the vital element in any manufacturer's success—the retail dealer."

THE ADVANTAGE IN PULLING TOGETHER

A BUSY New York manufacturer who prided himself on the military snap with which his business was run is now beginning to realize that activity does not necessarily mean profits. His beautifully systematized departments were churning away industriously. The reports of the heads of departments were models of clearness, and each told a story of efficiency. There were two or three departments which lost money regularly, but of course this was to be expected in a large and complicated business. As far as possible each department was conducted by its head as a separate business, crediting and charging every other department with material and work. And each department executive was expected to keep his costs down and his output up, to the very limit of his ability. The result was that

every man was keyed to vigorous effort and sharp initiative—no one leaned. The factory clacked through the day's work like a smooth running typewriter played by an expert. The owner took "a walk through the shop" every day at eleven o'clock to see how things were going on, and usually he returned to his office in a glow of satisfaction.

But one morning on his tour he heard high pitched voices at the desk of the manager of a new department established to sell a line of the factory's goods by mail. The growth of the department's business had been rapid and profitable. The manager's reports had shown steadily fattening columns of figures, and the manager was *persona grata*. Talking to him swiftly and earnestly, when the owner stepped up, was the regular sales manager, the general of the group of traveling men whom the establishment kept in the field.

"What's the matter?" asked the owner.

The story came out. The mail-order manager, by quoting lower discounts than the traveling men in the field, had been gradually building up the business of his department by taking away customers from the salesmen of his own house—and underselling them.

"Why," said the sales manager with tears of vexation in his eyes, "the boys on the road don't simply find their old customers unwilling to buy. They find them so mad at what they call the double-dealing of the house, that it's dangerous to approach them. And maybe the boys aren't wrought up," he ended.

The owner looked at the defiant mail-order manager.

"Do you think that's business?" he inquired.

The mail-order manager muttered something about "steadily increasing sales."

"But you're not the whole business," broke in the owner. "Don't you understand that every department in this establishment is only one unit in a big machine, and that all are supposed to work for the same end? For your department your sales are increasing, but if you're taking business away from the boys on the road, the total sales of our whole business are not increasing at all. We're selling the same amount of goods, and it's costing more to sell them."

When the mail-order manager had begun to see light and the irate sales manager had been smoothed down, the owner returned to his private office to think the matter over. His eye fell on a report just placed on his desk from one of the finishing departments. Pinned to it was a bill from another business house for some supplies the department had needed. He flushed as he looked at it, for his own factory turned out these same supplies, and ringing for a boy he sent for the head of the department, who a moment later stepped briskly into the room.

"Why did you get this stuff from those people? Why didn't you requisition it from McCarthy's department?" the owner demanded, pointing to the bill.

"I asked McCarthy"—McCarthy was manager of one of the manufacturing departments—"for an estimate on that job. He gave me one. I thought it was too high. I asked these outside people to bid. Their price was lower. I gave out the job. I try to run my department as economically as I can. That's business."

"Yes," replied the owner, who was beginning to wake to an understanding of the spirit of his busy establishment, "but maybe not *our* business. Did you know that McCarthy's department is run at a loss year in and year out, and that machinery he must have to meet the spring and fall trade is mostly idle in the dull seasons? Do you realize that the little saving you made on that job was swallowed up in the idleness of our machines, which cost us thousands of dollars, and which deteriorate every day?"

It took some explaining to make the young man see that it did not make half so much difference what price McCarthy charged for supplies—for this was a mere book-keeping figure—as whether he furnished them or not. When the young man saw, he had a broader view of the way in which one department in a complicated business depends on another.

The next day the owner called together heads of all the departments and told them these two little stories. He then proceeded to lecture them straight from the shoulder.

"Gentlemen," he closed, "run your departments just as efficiently as you can. But remember that you're all engaged in the same business. You're not competitors. Hereafter I shall expect every man in the place to be just as much interested in the economy and efficiency of other departments as he is of his own. A profit made at the expense of your shop mate is not a profit— it is very likely to be a loss."

AMONG THE WORLD'S WRITERS

TWENTY NOTABLE BOOKS OF THE YEAR

BY

FRANCIS W. HALSEY

THE notable books of the year have not necessarily been those of which there has been the largest sale, the most conspicuous advertising, or the most active discussion in print. In the enumeration below of the literary output of the year, these factors are considered in a secondary sense only, letting them stand (when they count at all) as confirmations or endorsements of what we believe to be the intrinsic qualities that have made these books the best in their respective classes. The list is confined to what are commonly known as "miscellaneous books," by which is meant the books that are sold over the counter by regular booksellers, and advertised in popular newpapers and periodicals. Technical and subscription books, including school books, medical books, and other publications not usually nor mainly sold through "the trade," have not been considered.

The books selected with the foregoing considerations in mind naturally group themselves into five classes.

History

In the histories named below, distinct contributions have been made to the knowledge of the subjects treated. Each is a book of which something will be thought and said for a period beyond the present; none is a compilation; none is without evidence of special research; in none has the author failed to resort to primary, rather than secondary, sources; in none has he written except after having mastered his material so well that he knew more than he has told.

1. James Ford Rhodes. A History of the United States from the Compromise of 1850 to the final Restoration of Home Rule in the South in 1877. Vols. VI and VII [completing the work].

2. De Alva Stanwood Alexander. A Political History of the State of New York, 1777-1861. Two volumes.

3. John Bach McMaster. A History of the People of the United States. Vol. VI.

4. Alfred Thayer Mahan. Sea Power in its Relation to the War of 1812. Two volumes.

5. Albert Bushnell Hart, Editor. The American Nation Series. (To be completed in 28 volumes). New Volumes: Vol. XIII, The Rise of American Nationality, by K. C. Babcock; Vol. XIV, The Rise of the New West, by F. J. Turner; Vol. XV, Jacksonian Democracy, by William McDonald.

6. Henry Charles Lea. A History of the Inquisition in Spain. (In four volumes.) Vols. I and II.

Biography

In the biographies are qualities akin to those seen in the histories. At least the first two named below are "final" books, the ground being covered so well that no one need go over it again; but should any one attempt to do so, these volumes will be found indispensable as source books. The other two books leave so little to be desired that they rise almost to the same height. Mr. Perry and Mr. Paul have done for Whitman and Froude about all that one could wish a biographer to do:

1. Winston Spencer Churchill. Lord Randolph Churchill. Two volumes, illustrated.

2. Elizabeth Robins Pennell. Charles G. Leland [Hans Breitman]. Two volumes, illustrated.

3. Herbert Paul. The Life of Froude.

4. Bliss Perry. Walt Whitman. Illustrated.

Travel

Each of the three books of travel named is an example of thorough work and occupies a place none other fills, or seems likely to fill. One of them, Prof. Jackson's, may be called a masterpiece of its kind:

1. A. V. Williams Jackson. Persia, Past and Present. A book of travel and research. Profusely illustrated.

2. Homer B. Hulbert. The Passing of Corea. Illustrated from photographs.

3. Budgett Meakin. Life in Morocco, and Glimpses Beyond. Illustrated.

Essays

In recent years, the successful book of essays has seemed threatened with extinction along

with the successful book of verse. Publishers say of the one as of the other that the public will no longer enable them to secure what they call "a justifying sale," using this term in a commercial sense. Mr. Benson, with his latest volume, as with its companion of last year, "The Upton Letters," has done something to disprove this maxim of the book trade, while Mr. Dawson has written some of the soundest literary criticism produced in many years:

1. Arthur C. Benson. From a College Window.
2. William J. Dawson. The Makers of English Prose and the Makers of English Poetry. Two Volumes.

Fiction

In the fiction of the year, several hundred volumes in all having been published, the work first named below (Mrs. Deland's) seems rightly to deserve a place with the literature that survives for many years after the date of the first edition. The second on the list (Mr. Wister's), if it make a claim less potent for survival, should at least long rank among the best books of a decade. The third (Mr. Kipling's) has already been accepted as a work in which its author has returned to his former mastery of his art and his public. The fourth (Mr. Churchill's) has secured for itself distinction as probably the best of the many big selling books its author has produced. The fifth (Mr. Sinclair's) may claim the honor of having achieved as an instrument of reform, a celebrity scarcely equalled since "Uncle Tom's Cabin":

1. Margaret Deland. The Awakening of Helena Richie. Illustrated.
2. Owen Wister. Lady Baltimore. Illustrated.
3. Rudyard Kipling. Puck of Pook's Hill. Illustrated
4. Winston Churchill. Coniston. Illustrated.
5. Upton Sinclair. The Jungle. Illustrated.

AN ACTIVE YEAR FOR THE NOVELISTS

NEARLY every English-writing novelist of reputation has published a book within the past twelve months, thus making the publishing year one of unusual interest and activity. From that group of older, distinctively American novelists, there were no books by Mr. James Lane Allen, Mr. William Dean Howells, Mr. George W. Cable, and Mr. Joel Chandler Harris; and from the younger school, none by Mrs. Alice Hegan Rice and Mr. Booth Tarkington. While Mrs. Wharton had no new book this year, the popularity of "The House of Mirth" reached from last year well into this. Two novelists—Mr. Thomas Nelson Page and Mr. Hamlin Garland—amplified old stories. There was no significant "discovery" such as attended the publication of "The Divine Fire," for example. There was great interest in Miss Sinclair's new work, but no adequate measure could be made from "Superseded" and "Aubrey Craven," which were published this year, because they were earlier stories and did not represent her developed power. The most remarkable publishing event of the year, measured by the practical effect that it had, was "The Jungle," which aroused the whole country and left the impress of the power of a book in a changed order of things in the industry that it described.

Another book with a purpose that succeeded (as a story), was Mr. Winston Churchill's "Coniston," in which he novelized his political ambition. Our three foremost women novelists were represented by books of art and ripened power—Mrs. Ward, by "Fenwick's Career"; Miss Glasgow, by "The Wheel of Life," and Mrs. Deland, by "The Awakening of Helena Richie." Mr. Kipling's book, "Puck of Pook's Hill," opened an entirely new field for this most versatile of literary men.

Jack London, in "White Fang," returned to the scenes of his greatest success. Mr. Wister broke a long silence with "Lady Baltimore." Other popular American writers who are represented in the year's output are: F. Hopkinson Smith, John Fox, Robert W. Chambers, George Barr McCutcheon, Dr. S. Weir Mitchell, Irving Bacheller, Stewart Edward White, Elizabeth Stuart Phelps, and Clara Louise Burnham.

No less active were the English novelists. Practically every one, with the exception of J. M. Barrie and Hall Caine, had a new book on the market. There were books this year by Marion Crawford, I. Zangwill, H. G. Wells, Richard Whiteing, Mary Cholmondeley, the Williamsons, Anthony Hope, Lucas Malet, Marie Corelli, Robert Hichens, Eden Philpotts, Ellen Thornycroft Fowler, Stanley Weyman, Conan Doyle, and John Oliver Hobbes.

SOME INTERESTING NEW BOOKS

MR. KIPLING in his new book, *Puck of Pook's Hill* (Doubleday, Page & Co.), has, lurking behind all his vivid and delightful story-telling, a sly and delightful purpose of making Imperial Britons of Little Englanders and good English folk of us all. You may conceive the book as a kindergarten of Imperialism wherein Puck is master, to teach the rising generations to thrill with pride in the glories of England even as Mr. Kipling himself thrills. Oak, Ash, and Thorn are the symbols of these glories and by their wizardry Puck (the ancient spirit of the soil) summons out of the past strong men and gentle of this race—as well as of Latin, Saxon, Norman, Celt, and Composite—each to tell with his own lips a brave tale of deeds done in old days; and every brave tale has a lesson for the new times. It is useless to pretend, of course, that the real child will read the tales with any such deep appreciation as the grown-up will, but you must figure all who read as children of the Island mother. As a sort of fiction, it seems enough to say that the stories are among the most admirable that Mr. Kipling has done, not less strong than earlier stories but certainly mellower. As preachments, they work by inspiration, not by precept. Because Mr. Kipling's own passionate pride of race burns in them and makes them glow, they stir the flame in the reader. To put it another way, the great teller of tales has given us a new cycle of the Round Table, a bigger table where all the races of England sit as peers and high exemplars of imperial English virtues. And the verses between the tales are charming.

That the English novel as Thackeray left it—big, broad, human, mellowly reflecting life as a whole—has not been quite extinguished by fashionable clinics in the pathology of feminism, studies in the new sociology, and books of sublimated Sunday newspaper stuff, is proved by the appearance of Mr. William de Morgan's *Joseph Vance* (Henry Holt & Co.), called also, and with deep-dyed mendacity, "An Ill-Written Autobiography." Mr. de Morgan is an English gentleman aged seventy, hitherto no novelist, but his Joseph Vance, a man of our own time, is of the blood kinship of Colonel Newcome and Henry Esmond. If you do not hold these gallant gentlemen in your heart you may spare yourself Vance. If you do, there has been no novel since Thackeray's own that will give you so much honest comfort and delight. Here is the transcript of a man's life from round-eyed boyhood to old age—full of wholesomeness, humor, sanity, charity, tenderness, of the friends he made, the women he loved, the dreams he dreamed, the thoughts he thought, the things good and bad that he saw, did, and suffered.

That "specialist in futurity," Mr. H. G. Wells, in a volume called *The Future in America* (Harper's), has dwelt entertainingly on the contemporary phases of America as he found it during a recent visit. Upon superficial and spectacular aspects of New York, and upon equally superficial if less spectacular aspects of Boston, Mr. Wells delivers himself of some rather inspiring epigrams, not without the shock and thrill of truth. Much that is said about Boston will give joy to New York. Some things said about New York will give pain to Boston.

The Brothers' War, by John C. Reed (Little, Brown & Co.), is an attempt to treat the clash of the states from a modern scientific point of view as the inevitable result of evolutionary processes. Mr. Reed, an ex-Confederate soldier and a lawyer of antebellum training, belongs by right of years to a generation which prefers to trace events to moral causes or to argue upon legal "rights." But the division of the sections, as he sees it, grew out of two unconscious tendencies to nationalization—a tendency of all the states to grow into one nation, and a like tendency of the slave states to grow into a more circumscribed nation. Since the same states were subject to both tendencies, the two had to meet and one must destroy the other. As for the superficial causes of division, they were really effects. This treatment impugns the motives of neither side. Mr. Reed admits that the South saw itself fighting for guaranteed constitutional rights; that the North saw itself fighting for Freedom. But he shows that the ultimate facts lay deeper in the forces of nature itself.